COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper
Second-class postage paid at Boston, Mass., and additional mailing offices

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August 9, 1976
Vol. X, No. 32

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NEWSPAPER

New Definitions Proposed

FCC Renewing Computer Inquiry

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has initiated a second Computer Inquiry to update its original 1971 decision and apply current definitions to the boundary between data communications and data processing.

In approving a second inquiry, the commission said distributed networks in which CPUs and terminals are performing both data processing and "communications control applications" had been one of the developments "tending to cause a blurring" between the two major areas.

Users are finding it cost-effective to remove some of the computing power from the DP center and distribute it to terminals or incorporate this power "into the network itself," the FCC noted.

Under proposed amendments to its earlier Computer Inquiry decision, the commission issued a more specific definition of data processing and also proposed eliminating the concept of hybrid service. Interested users and others are being urged to comment on the FCC proposals.

Data processing would be defined "as the use of a computer for the purpose of processing information wherein (a) the semantic content, or meaning, of input data is in any way transformed, or (b) where the output data constitute a programmed response to input data."

Provisions for Carriers

Under the proposed changes, common carriers would be allowed to use DP for "network control and routing," which would include message and circuit switching, speed and code conversion, pulse format conversion, error detection and correction, analog-to-digital and digital-to-analog conversion, signal processing and time division multiplexing.

Carriers would also be able to use DP for input/output processing, which would include using a computer in a network to make different types of CPUs and terminals compatible with each other.

Carriers would be barred, except through separate subsidiaries, from providing "arithmetic processing, word processing or process control." The separate subsidiaries could engage in "general commercial accounting, payroll, inventory control, banking and point-of-sale processing, financial and econometric modeling, scientific calculations, etc."

Word processing as defined by the commission includes "interactive information retrieval systems, management information systems, text editing, translation, typesetting, etc."

Under process control, the FCC would include applications where a CPU is used "to monitor and control some process which is occurring continuously," such as generating stations and automatic ma-

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At ICCC

FCC Chief Calls Policy 'Conscious Flexibility'

By Ronald A. Frank
Of the CW Staff

TORONTO – The current policy of the Federal Communications Commission (FCC) toward data communications is one of "conscious flexibility," with the commission relying on the economic and technical judgments of the marketplace, according to Richard E. Wiley, FCC chairman.

Speaking at the opening session of the Third International Conference on Computer Communication (ICCC) here last week, Wiley said this policy approach is being applied in such areas as the selection between packet and circuit switching, between satellite and terrestrial transmission media, between general-purpose and specialized networks and between different terminal devices.

'Inevitable Competition'

Rather than referring to "contrived competition," it would be more appropriate to talk about "inevitable competition," the FCC chairman told the conference attendees.

This competition is inevitable because in the postindustrial era there are growing numbers of specialized applications of telecommunications that can improve people's standard of living and there are a growing number of firms and individuals with ideas and products to satisfy those needs, Wiley said.

If current FCC policies were to be characterized in a single word, that word would be "freedom," Wiley indicated.

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Datapac Debuts Using Nonintelligent Units

TORONTO – The Canadian Datapac data communications network is operational and will begin serving customers within the next few months.

The inaugural demonstration was held here last week by Bell Canada and officials of the Trans-Canada Telephone System during the International Conference on Computer Communication (ICCC).

The demonstration of the intelligent packet-switching network included nonintelligent terminals connected to the network via a network interface machine (NIM). The terminals transmitted data at speeds of 300- to 1,200 bit/sec to the Toronto Datapac node.

From this node, messages were transmitted at 9,600 bit/sec to an IBM

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File Match-Up Uncovers $250,000 Welfare Fraud

By Catherine Arnst
Of the CW Staff

NEW YORK – After a computer match-up of welfare rolls and payroll lists, the Bronx district attorney ordered the arrests of 42 state and city employees for allegedly collecting $250,000 in fraudulent welfare payments over a three-year period.

Twenty-nine were arrested late last month; the others are still being sought. The mass arrests were made partially "to emphasize a point," District Attorney Mario Merola said.

"If [state and city] agencies would make a simple check of their employee rolls by running the names and Social Security numbers through the welfare computer, these rip-offs would be brought to an immediate halt," he said.

The arrests originally stemmed from anonymous tips received by Merola's office and the Human Resources Administration (HRA). A check was made on the HRA's IBM 370/158 to see whether each person was actually working for the state or city and simultaneously collecting welfare.

None Previously Arrested

The amounts collected illegally by the 42 charged with larceny ranged from $1,500 to $24,000 each, Merola said. None of those arrested had criminal records.

Ironically, one source noted, the arrested employees are in low-salaried positions and some would have been eligible for welfare if they were heads of households and had applied for the funds. The top salary in the group was $9,500.

Since January, 80 public employees have been arrested with the computer match-up method, Merola said. About 90% of the arrests resulted in convictions, according to Det. Salvatore Giunta, head of the Welfare Fraud Bureau of the district attorney's office.

Giunta stressed that if each public agency ran a check with the Welfare Department's computer whenever a new employee was hired, welfare fraud could be cut down enormously. "A good 80% of welfare fraud is concealed employment," he estimated.

"When the Police Department submitted 500 employee names, they came up with 50 cases of fraud," he said. All the district attorneys' offices check new employees through the computer match-up system when they are hired, he said.

In the first seven months of 1976, $11 million was saved by stopping welfare fraud with this method, HRA said. After making such a match-up in November 1975, the department cut off assistance to 1,505 cases and reduced payments in 726 cases.

UK Omits DP Experts in Group Created to Frame Privacy Laws

By Joseph Hanlon
Special to Computerworld

LONDON – The Home Secretary has announced the makeup of the Data Protection Committee (DPC) – and not one computer expert was named to the body mandated to frame legislation for controlling data banks.

While one member of the computer industry was included, his appointment has only added to the controversy surrounding the DPC appointments. He is John Hargreaves, IBM's director of public affairs in the UK and an ex-member of M15, the military intelligence branch concerned with counterespionage and countersubversion in Britain.

Hargreaves thus has links with two of the organizations which cause the most public concern on the privacy front, critics of the DPC appointments have charged.

In addition, they pointed out, only two members have any involvement with data banks, and that primarily on a management level.

One industry observer commented that, with the current makeup of the DPC, "the Home Office got its own way. The members are all people to whom government pressure can be applied.

"I can't see *that* committee putting pressure on any government department, yet that is just what is needed," he added.

The only member of the DPC with a privacy background is Paul Sieghart, who was brought in from outside the govern-

(Continued on Page 4)

DG Shows Nova 3 Capable of Running Simultaneous Tasks

By Esther Surden
Of the CW Staff

SOUTHBORO, Mass. – Data General Corp. (DG) upwardly expanded its Nova 3 family last week with the introduction of the 3/D, a minicomputer which it said features a 32K-word MOS memory board and the ability to run dual operations.

Also introduced was the Dasher family of 30- and 60 char./sec terminal printers.

The Nova 3/D, which can support up to 128K words of memory, uses "fundamentally the same CPU" as the earlier Nova 3 models, a spokesman noted.

The system is compatible with Nova-line software and peripherals, he added, and application programs can be run on it

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700.

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Proxmire Decries FCRA Limitations...

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The only law that comes close to protecting individual privacy in the consumer marketplace is the Fair Credit Reporting Act (FCRA) – and even this law is inadequate for today's world, Sen. William Proxmire (D-Wis.) told the Privacy Protection Study Commission at hearings conducted here last week.

The hearings, which culminated many months of examining recordkeeping practices in the private sector, focused on the firms whose product is personal information – the credit, investigative and commercial reporting companies.

"The activities or organizations engaged in consumer reporting cut across the entire fabric of American society," David Linowes, comission chairman, pointed out in his opening remarks.

"Virtually everyone who has applied for any type of credit, loan, life or automobile insurance, has been considered for certain types of employment or applied to rent an apartment has been the subject of a consumer report," he said.

Information recorded and communicated about an individual may range from minimum identifying data to the most intimate details of personal, physical and behavioral characteristics, Linowes added.

Privacy violations resulting from misuse of such sensitive information are compounded by the increasing computerization and centralization of these files and the matter bears careful scrutiny, according to Linowes.

No Prior Notice

Under present law, consumers receive no prior notification that reports will be prepared about them and only in the case of investigative reports – those that involve personal contact with friends and neighbors – is the consumer even told that a report has been or may be prepared, Proxmire told the commission.

Further, he said, present law requires that a consumer be advised of the identity of the reporting agency which supplied a report upon which he was denied credit, insurance or employment.

But denial of benefits or higher rates for those benefits are not the only adverse actions that a consumer report may precipitate, and the FCRA leaves those possibilities untouched, he said.

Earlier testimony before the commission showed "many life insurance companies make their decisions based on reports supplied by the Medical Information Bureau, even though that bureau's own bylaws prohibit such reliance. Here is one clear case where consumers are being affected by reports they may never know have been made," he said.

Further, although some are beginning to provide copies of files to consumers, the present law only requires agencies to disclose the "nature and substance" of that file, he said.

If the consumer wishes to challenge the information in his file, he may do so, but the reporting agency is not required to tell him of this right or of his right to file a written statement which must be included in subsequent reports, Proxmire added.

The senator also noted that under one of the compromises in the original FCRA, a consumer need not be told in advance of signing a credit or insurance application that such a report is being prepared.

The consumer may be notified three days later and, if he wants more details at that time, the report user must disclose only "the nature and scope of the investigation," he said.

Questions Asked

Among the questions asked by one of the largest investigative agencies for auto insurance investigations is: Is the applicant "active in any clubs or church groups or does he have any hobbies?"

It also asks about "criticism of home environment, associates, character or morals, parents or other members of the family, and how the applicant's spare time is spent," Proxmire said.

Finally, when medical information is to be gathered about a consumer in connection with an application for insurance, the consumer must sign an authorization form. This form is a blanket OK for any doctor or medical institution to release the consumer's medical history to the company, he said.

Shouldn't the consumer know that data may also be used in connection with reinsurance, job promotion or workman's compensation matters? Proxmire asked.

Shouldn't the consumer know that data may also be used in a case history for medical study in the training of physicians or to compile official reports to supervisory agencies, peer review or malpractice situations, or may be reviewed for death or disability claims? he added.

Nothing in the present law requires that individuals be told of these future uses or of the recording of their medical histories in the medical information bureau for use in connection with future insurance applications, Proxmire said.

"Businessmen need information about their customers in order to make sensible, sound decisions about credit, employment and insurance."

But, he indicated, it is equally clear that consumers are entitled to a measure of control over the collection and distribution of information about them.

"The fact that reporting agencies may 'own' [an individual's] physical report does not give them unqualified control over its contents or its use," he stated.

Wants Action Soon

Proxmire, who supports extending consumers' privacy protection which was "modestly" provided for by the FCRA of 1970, would like to see action in this area even before the commission makes its final report next year.

The Senate Banking, Housing and Urban Affairs Committee, which he chairs, has drafted and held hearings on a bill (S. 1840) that would amend that law. But chances are "slim" the bill will reach the Senate floor soon since a policy decision has been made not to take up anything "controversial" until January, he said.

Mandatory Consent Urged

Consumers should have to give their "informed consent" for the collection and distribution of information about themselves, he said.

Few consumers realize that in signing an application for insurance or employment they are consenting to a broad-ranging investigation of their character, morals and lifestyle.

"The individual should be able to know when that information has been used against him and by whom. Otherwise, we give approval to secret decision-making processes which the consumer is powerless to confront or chenge," he said.

The consumer is also entitled to know that information gathered about him is accurate, complete and relevant to the purposes for which it is used, Proxmire stated.

Further, the credit, insurance or job applicant "should not be subject to slipshod investigative techniques or haphazard data collection, distorted recording, reporting or evaluation methods.

"Finally, insurance actuaries ought to be made to justify their claimed 'need' for subjective and personal information," he added.

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...But Credit Reporters See More Laws Harmful

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Further government efforts to restrict the use of personal information within the credit reporting industry would increase costs to credit reporting agencies and seriously reduce the individual's ability to obtain credit, the Privacy Protection Study Commission was told here last week.

These costs could also drive many small credit reporting agencies out of business and force small merchants to abandon private credit plans in favor of bank cards, credit bureau spokesmen said.

Rep. Jake Garn (R-Utah) supported their view, basing his opinion on "facts revealed during hearings" on proposals to strengthen the Fair Credit Reporting Act (FCRA) conducted by the Senate Banking, Housing and Urban Affairs Committee chaired by Sen. William Proxmire.

Garn, ranking minority member of that committee, articulated a view contrary to that of the committee chairman, who testified the day before.

"Often when Congress passes a law protecting the consumer it is actually denying the shopper free choice in the marketplace. The cumulative effect of these laws is killing individual initiative and stifling small business," he argued.

Garn urged the commission to answer the questions "who will benefit?" and "who will pay?" before supporting new consumer privacy protection legislation.

The recent banking committee hearings showed Garn the FCRA "is working well," he said.

Consumer Complaints

While it was alleged that 20,000 consumer complaints had been received by the Federal Trade Commission since the FCRA went into effect, only 682 of these could be defined as actual valid complaints; less than 100 of these involved investigative, as opposed to consumer, credit reports and only 343 actual complaints were lodged against credit bureaus, Garn said.

Chief among the complaints cited were "relevancy and the actions taken by credit grantors in denying their applications," he said, adding one said consumers did not have access to information in their files and were therefore denied an opportunity to correct inaccurate information.

Credit industry spokesmen told the commission about a new voluntary program that permits individuals to examine hard copies of their files and even obtain copies to keep in some cases, going far beyond the requirements of the FCRA.

John L. Spafford, president of Associated Credit Bureaus, Inc. (ACB), said ACB's members pioneered this policy. ACB represents 1,800 small credit bureaus in cities with less than 20,000 inhabitants.

W. Lee Burge, president and chief executive officer of Equifax, Inc., formerly Retail Credit Corp., said his firm would begin the practice Oct. 1.

Spokesmen from all the credit bureaus represented at the hearings denied allowing government agencies and law enforcement agencies "unlimited access" to credit bureau file-type information.

Generally provided to enforcement agencies is "a lead" – name, address and employer, according to Spafford. Accordingly, it is against policy to obtain information from law enforcement agencies, the spokesman said.

Other Inquiries

As for other government inquiries, "less than 2% of the average credit bureau's annual volume is accounted for in regular reports to government agencies of all kinds," Spafford said. Nearly two-thirds of that 2% is for mortgage loan reports for the Federal Housing Authority or Veterans Administration, he added.

The other one-third of the 2% goes to various state agencies for granting jobs or professional licenses, which is a "permissible purpose" under the law, Spafford said.

The only legal way for a government agency to obtain credit bureau information not specifically covered in the permissible purposes provisions of the FCRA is through a subpoena issued by a court with proper jurisdiction. This would rule out the use of so-called "pocket" or "administrative" subpoenas, Spafford said.

Defining consumer credit reports as those containing simple factual information about an individual's credit history and investigating reports as those containing "more subjective" information, such as information on lifestyle, sexual preferences and health often gained from third parties, another spokesman for Equifax explained all data included in an investigative report must be confirmed by more than one source.

Information provided by a neighbor that cannot be confirmed, for example, is omitted from the client's report and no "raw notes" taken by investigators during interviews are retained. The individual then sees exactly what the client receives, he added.

While those appearing on behalf of the credit industry were opposed to new legislation, they conceded they could live with several key concepts suggested by the commission.

Among them is the concept that, while the reporting customer should be considered the "owner" of an individual's credit report, the individual should have a right to control its use much like the owner of a copyrighted document.

"One may own a book without having a right to copy and distribute it," Willis Ware, commission vice-chairman, pointed out.

Further, while testifying that they, not the credit grantor, should be the only ones to discuss a report with the individual about whom it was prepared, most agreed the explanation should be in the responsibility of the credit grantor when credit is declined for reasons other than material contained in the report.

After a general presentation by Spafford, Barry Connelly, another ACB spokesman, agreed to translate some of the numbers embodied in ACB's testimony.

ACB members, which produce 100 million credit reports annually, received two million requests for disclosures from the data subjects last year. Of that number, according to Connelly two-thirds, or 1,333,333, were requested after credit was denied, as permitted by the FCRA.

Of that number, 75,000 people inserted statements clarifying their side of disputes between themselves and merchants.

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FCC Inquiry to Probe DP, Communications Boundaries

(Continued from Page 1)

chine tool uses.

The proposed changes eliminate the hybrid service definition which said that services which were primarily communications-oriented but included incidental DP would be regulated and that services which were primarily DP-oriented but included incidental communications would be unregulated.

The proposed rules define CPUs as "general-purpose stored program processors, general- and special-purpose minicomputers and microcomputers." Processing would be defined as "the use of a computer for operations upon data which include arithmetic and logical operations, storage, retrieval and transfer.

These regulations "provide a demarcation between data processing services and communication services. By so defining data processing, we have deleted the 'hybrid service' concept and henceforth a service would be characterized as either data processing or communications," the commission said.

Explaining the FCC's logic behind the proposed rule changes, commission chairman Richard Wiley last week told attendees at the International Conference on Computer Communications in Toronto that "developments in distributed processing, switching and terminal equipment have put a severe strain on the definitions and rules that were laid down in the area of centralized data processing and electromechanical switching."

Wiley described the proposed definition as "a positive definition of data processing" in terms of "what it is rather than by exception, as we have done previously."

By sharply defining the regulatory boundary between DP and communications, technological and marketing developments will be stimulated by removing earlier ambiguities, he added.

In a related action, the FCC said it would call a future planning conference to consider the technological and policy aspects resulting from the convergence of computers and communications. Tentatively scheduled for September, the meeting will be open to the public.

Comments on the proposed rules are due by Oct. 11.

Users who send comments on the DP proposals should refer to "the adoption of proposed amendment to Section 64.702 of the commission's rules and regulations as set forth in Appendix A."

Datapac Demonstrated at ICCC

(Continued from Page 1)

370/168 operating under VM/370 at Bell Northern Research in Ottawa. The CPU included an IBM 3705 front end modified with software to make it compatible with the X-25 packet-switching protocol adopted for use on the Datapac network.

The X-25 standard was implemented using the Standard Network Access Protocol (Snap), which is the Datapac version of X-25.

Various terminals were used in the demonstration, including CRTs and teleprinters. Also demonstrated were the Addressograph Multigraph Corp. Amcat credit authorization terminal and the NCR 280 point-of-sale transaction terminal.

The demonstration included an international interconnection with the French RCP experimental packet-switched network. RCP was described by French officials as the forerunner of the Transpac network that will begin serving French users in 1978.

The three operating RCP nodes in France were interconnected with a fourth node set up at the Toronto Datapac facility for the demonstration. The transatlantic link included a 9,600 bit/sec circuit split into dual 4,800 bit/sec data streams.

As part of the RCP demonstration node, an X-25 interface was programmed onto an Intel system that included an 8K 8080 microprocessor. A Digital Equipment Corp. PDP-11/35 was used as the node processor, according to the RCP representative.

The Datapac network was used to register ICCC attendees. About 1,000 attendees at the conference represented 23 countries, according to David Horton, director of computer communications planning with the Trans-Canada Telephone System, who was conference governor.

About 150 attendees were from foreign points off the North American continent, he said.

Privacy Unit Omits DP Experts

(Continued from Page 1)

ment to draft the white paper, "Computers and Privacy" [CW, Dec. 31-Jan. 5], which led to the committee's establishment.

Even the government-sponsored National Computing Centre was not represented in the 14 DPC appointments.

The committee was established to advise the government on the control machinery needed to ensure that existing and future systems holding personal information "are operated with appropriate safeguards."

It is also to evaluate "the objectives to be included in legislation" establishing permanent safeguards, according to the Home Secretary's announcement.

The British Computer Society (BCS) criticized the DPC's membership for its lack of technical expertise. The society is said to be "hopping mad" about the appointments.

The BCS is especially upset because the considerable assistance it offered in selecting the DPC membership was rejected. The society put forward the names of more than 25 people actively involved in computers and privacy, none of which were included on the DPC appointements.

This was all the more surprising because the government accepted a BCS offer to study the computer aspects of the controversial 1971 census and published the society's conclusions as an official government report.

The National Council for Civil Liberties (NCCL) has declared that "a majority of the committee consists of people professionally involved in collecting sensitive information about individuals. Only one of its members has a known history of concern for the individual's privacy."

The only DPC members with data bank involvements are Charles Reed, director of the Inter-Bank Research Organization, and Ken Potts, chief executive of Leeds City Council. Leeds is currently building a data bank of information on property and people. Known as Lamis, it is expected to be the basis of systems in several other cities.

In its evaluation of the DPC, NCCL said "it is hard to believe this committee will properly appreciate the urgent need to control the collection and use of confidential information. It is more likely to be obsessed with technical aspects of computer security and the cost of protecting privacy."

According to one insider, much of the DPC membership was selected from the civil servants' list known as "The Great and the Good" – those who have achieved eminence in something and are unlikely to offend the civil service.

The result, he said, is that the committee does not draw on any of the expertise built up in the past six years and will have to start from scratch all over again.

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The Employee Retirement Income Security Act of 1974 effective January 1, 1976 [illegible] the recording of all hours worked and not worked, compensated and [illegible] well as all dollars affecting employee pension benefits.

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FCC Judge Rules AT&T Spin-Off Of Western Electric Unwarranted

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – A Federal Communications Commission (FCC) administrative law judge said last week that AT&T should not have to divest itself of its manufacturing subsidiary, Western Electric Co.

Judge David I. Kraushaar also found that AT&T's long-distance rates are reasonable in relation to its rate of return.

The rulings are part of an ongoing proceeding and came in the form of recommendations still to be considered by the FCC. They constitute a portion of Phase II of the FCC's hearings on AT&T charges and corporate structure begun in 1971 and will probably not be considered until early next year.

The judge's rulings balanced off previous FCC staff recommendations that AT&T be ordered to spin off Western Electric [CW, Feb. 9].

When the FCC began its investigation, it claimed the rate base on which the phone company bases its tariff charges is excessive and should be reduced.

In his opinion, Kraushaar said the "monumental record . ... in this proceeding fully justifies AT&T's continuing existence intact as a quality common carrier that provides excellent telephone service to a very large population."

The "integration" of Western Electric and Bell Laboratories in the Bell System "has provided, and continues to provide, definitive useful public benefits in the form of systemwide expertise and innovations that have, in turn, led to monumental technological advances," he added.

Although the FCC should upgrade its policing of AT&T's rate charges, "the problem of managing Bell's 'bigness' . . . simply doesn't call for the altogether extreme and revolutionary remedy of divestment and splinterization in the holy names of 'competition' and 'free markets,' " Kraushaar stated.

Rate of Return 'Reasonable'

Earlier this year the FCC decided AT&T is entitled to a return on its long-distance operates of 9.5% or up to 10% if the extra amount results from efficiencies. The previously authorized rate of return was 8.7%.

Kraushaar found that the over interstate revenue levels of AT&T's various operating companies in relation to overall interstate revenue requirements are "reasonable and capable of providing rates of return at reasonable levels" previously determined by the FCC.

Kraushaar also found AT&T's long-distance rates and charges are reasonable and just or at least not "unjust or unreasonable discrimination."

The order would also require AT&T to end all restrictions on sales of Western Electric equipment to non-Bell companies and to take steps to encourage Bell companies to buy equipment made by companies other than Western Electric.

Thomas S. Nurnberger, AT&T executive vice-president, said the company was "gratified" with the judge's findings, which he termed "sound."

AT&T has "always been convinced that the research and manufacturing capability built into the Bell organizations benefited telephone customers," he added.

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CMI Reopens After Refinancing

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) has reached agreement in principle with its lending banks on a plan for additional funding.

The funding enabled CMI to resume operations on a reduced scale after closing down for more than a week because of financing problems [CW, Aug. 2].

CMI will sell its equipment now out on lease to an independent company in satisfaction of a debt of about $13 million owed to the lending banks.

The firm will have a contingent liability on the sale of up to $1.5 million on the leased equipment if the revenues from this equipment fail to achieve specified levels.

Nova 3/D Capable of Running Dual Operations

(Continued from Page 1)

without modification. The Nova 3/D runs under the firm's Real Time Disk Operating System.

Designed for the data entry and scientific user and for the small business user through systems houses, the 3/D is a "medium-scale mini," larger than Digital Equipment Corp.'s PDP-11/34 but smaller than the PDP-11/70, the spokesman noted.

The Memory Mapping and Protection Unit (MMPU), added to the Nova 3/D, is the hardware enhancement that allows concurrent batch and multiterminal operations. It performs logical-to-physical address translation, giving user programs access to 128K of memory through four address extension tables, or maps, including two program maps and two data channel maps, DG said.

Memory mapping and protection also permit privileged instructions, I/O device protection, main memory write and validity protection, the spokesman added.

The system can accommodate 700 nsec 16K-, 8K- and 4K-word semiconductor memories and 800 nsec 8K or 1,000 nsec 16K core memories as well as the 32K board.

The 700 nsec 32K memory, introduced for the Nova 3/D, can be used on all Novas. The DG-produced two-layer printed circuit board uses 4K random-access memory (RAM) chips.

An alternate board using Texas Instruments parts is also available, the firm noted.

Modular Terminals

The Dasher terminal printers, though introduced with the 3/D, were designed for use with all of the firm's minicomputers. The terminals, also made by DG, are modular with a "minimal parts count" for reliability, DG said.

The Dasher line consists of four models; both the 30 char./sec unit and the 60 char./sec model come in keyboard send/receive (KSR) and receive-only (RO) versions. All models print 132-column lines.

A single printed circuit board in the printer base contains all interface, control logic and encoder electronics, DG said. Modules for printhead/carriage drive, paper feed, ribbon drive and keyboard array can be easily accessed for service, the spokesman added.

The terminals, which can be used off-line as typewriters, feature a lead screw drive mechanism for the printers, he noted.

The terminals are interface-compatible with DG systems and character-compatible with Teletypes and other Ascii input devices, DG said, adding they can be interfaced to 20ma current loop and EIA RS-232C devices using asynchronous controllers or multiplexers.

The standard character set is 128 characters of upper and lower case Ascii. A 96-character European and an Asian character set are available and up to 29 function codes can be optionally added.

Users can field-select upper and lower case format or all upper case format, DG said.

Product Prices

A typical Nova 3/D configuration with 96K words of MOS memory with parity, MMPU, battery backup, memory parity control, power fail/auto restart, automatic program load, real-time clock, two 10M-byte disks, 300 line/min printer, 75 in./sec magnetic tape drive, 30 char./sec terminal printer and four CRTs costs $86,950.

The processor with 32K words of MOS with parity costs $14,400.

The Dasher Model 6042 30 char./sec KSR terminal costs $2,400; the 6043 RO version costs $2,200. The Model 6040 60 char./sec KSR terminal is priced at $2,650 while the Model 6041 RO unit costs $2,450.

FCC Policy Termed 'Conscious Flexibility'

(Continued from Page 1)

"We are allowing freedom of entry into the data transmission area by new carriers; that customers be allowed to have freedom to connect their own properly certified terminal equipment directly to the lines of established carriers; that entrepreneurs be able to lease basic transmission capacity from established carriers and to tailor that capacity to the specialized needs of their own customers.

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'Reasoned Evolution'

Recent FCC decisions fostering competition represent a "reasoned evolution from past policies"; the competition that stems from these decisions is the result of phenomenal changes in electronic technology outside the control of the monopoly carriers and the dissatisfaction of specialized users with the regular services offered by these carriers, he said.

Commenting on the opposition to competitive policies by the established carriers, Wiley said "there is no evidence to suggest that rates for basic telephone service have been perceptibly impacted by the meager amount of competition introduced to date.

"And," he added, "there are adequate remedies available for dealing with any possible prospective adverse effects long before they could occur."

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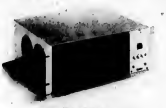

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Problems Cited in Discontinuing SSN as Identifier

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Discontinuing use of the Social Security number (SSN) as an identifier might prove more difficult for computerized record systems than the drafters of the Privacy Act of 1974 might have expected.

In a recent speech before local chapter members of the Association for Computing Machinery here, Samuel I. Schaen, coauthor of *The Privacy Act of 1974: A Reference Manual*, explained why.

Individuals are not required by law to remember or provide their specialized identification numbers, he said. Thus a cross-reference table based on personal characteristics is needed to identify individuals in record systems, Schaen said.

Second, to transfer information between systems, especially corrections, recordkeepers must be able to identify the same individual in more than one system of records, he said.

Cross-Referencing Problems

In the case of a cross-reference table for individual identification, the Office of Management and Budget (OMB) guidelines for implementation of the Privacy Act of 1974 suggested agencies use a combination of personal characteristics, such as date and place of birth, parentage and so forth, in addition to the individual's name.

This would be relatively simple in a manual system, but would require considerable character string manipulation in a computer system, especially since names are not always precise, Schaen said.

"Individuals will often use shortened forms of their names so that 'Bill Jones,' 'William Jones' and 'William Jones Jr.' may, in fact, refer to the same individual.

"Likewise, a person's birthplace may also be subject to the multiname phenomenon," he said. For example, "'Richmond,' 'Staten Island' and 'New York City' are all legitimate birthplace descriptions for individuals born on that borough/island which is part of New York City.

"With the exception of statistical records, each individual must have a unique identifier for that system to function" or there can be "no guarantee that information will be recorded accurately or be assigned to the proper individual" – another requirement of the act.

Functioning Problem

While it is possible to establish cross-reference tables of personal characteristics as an alternative to unique individual identification, many existing systems cannot function without the presentation of the unique individual identifier used to index the system.

Moreover, a generalized solution to this problem for automated systems could be very costly, he said.

Same Arguments Used Pro and Con

The arguments used to support the concept of a standard universal identifier are the same arguments made against it, he said.

The potential intersystem linking of individual records made possible by a standard universal identifier increase the potential of accumulating comprehensive data files on individuals.

Use of multiple identifiers increase the possibility of erroneous information being propagated uncontrollably or at least uncorrected, he said.

The choice, therefore, is between multiple unique identifiers and a standard universal identifier with other safeguards to prevent abuse.

While generating corrections is costly without a standard universal identifier, it is, nevertheless, possible to do, he said, noting that the objective is for the source agency to convey the identity of the individual in question to the previous data recipient.

The recipient agency, if it maintains a record on that individual, must, in turn, make the prescribed change in its record and then pass the correction along to any other agencies to which it had disclosed the record.

Identifier Eases Association

Certainly the association would be eased if a standard universal identifier were used by both systems, he said.

Agencies barred from using a standard numerical identifier might be inclined to standardize types and formats of the characteristics used, creating a de facto standard and thus defeating the spirit of the law.

A Possible Alternative

As a possible alternative, Schaen suggested the date, time and source of the original transfer of information be maintained by both agencies for use in matching a record.

"There is a very small probability an agency would disclose data for two identically named individuals at the same time," he said. Furthermore, the agency could take steps to assure that such a coincidence could never happen.

The only additional requirement placed on the recipient agency would be an acquisition log or some other indication of when the receipt of the original disclosure occurred. It is here that additional costs and complexity might prove prohibitive, Schaen suggested.

Russians Plan to Use DP To Seek Greener Pastures

MOSCOW – Russian shepherds will be able to determine the best feed routes for their flocks through the use of computers, according to Tass, the Soviet news agency.

Airplanes will provide photographic information about the ripening stages of grasses which the computers will process. The results will be communicated to the shepherds, Tass said.

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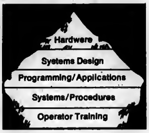

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Societies/ User Groups

Afips Elects Williams as President

MONTVALE, N.J. – The American Federation of Information Processing Societies (Afips) has elected as president Dr. Theodore J. Williams, professor of engineering and director of the Purdue Laboratory for Applied Industrial Control at Purdue University.

The Afips Board of Directors also reelected Dr. Albert S. Hoagland as vice-president, Dr. Sylvia Charp as secretary and Walter A. Johnson as treasurer. They assumed office July 1 and will serve for one year.

Williams, a past president of the Instrument Society of America, has served as secretary of the National Computer Conference Board and Chairman of the Afips Special Committee on Membership. He is currently chairman of Technical Committee TC-5, Computer Applications in Technology, for the International Federation for Information Processing.

He has authored or edited 10 books and published approximately 225 technical papers. Before joining Purdue, Williams was senior engineering supervisor in charge of computer control development at Monsanto Co. and visiting professor of automatic control at Washington University.

His B.S., M.S. and PhD degrees in chemical engineering were received at Pennsylvania State University and he also has an M.S. in electrical engineering from Ohio State University.

Lord Steps Down at SCDP

WASHINGTON, D.C. – Kenniston W. Lord Jr. has stepped down as president of the Society of Certified Data Processors (SCDP) and taking his place is G. Gary Casper, former vice-president of SCDP.

Lord decided to hand over the office so he would be free to concentrate on the society's Candidate Assistance Program (CAP), according to Wayne J. Smith, executive director.

Casper, who assumed office April 1, announced three goals he hoped to achieve during his tenure: an increase in membership, industry recognition of the Certificate in Data Processing (CDP) as a standard of acknowledged data processing proficiency and competency and the development of programs and materials that will enhance the value of the CDP.

Casper is a visiting professor of computer science at Brigham Young University.

Calendar

Aug. 16-18, Hershey, Pa. – The Eight Annual Meeting of the National Association for State Information Syatema (Nasis). Contact: Carl Vorlander, Executive Director, Nasis, P.O. Box 11910, Lexington, Ky. 40511.

Aug. 18-20, Cupertino, Calif. – Four Phase Users Association Annual Meeting. Contact: Phil Shapiro, Allied Chemical Corp., P.O. Box 1039-R, Morristown, N.J. 07960.

Aug. 19-21, San Jose, Calif. – Association of Field Service Managers Conference on Maintenance(AFSM). Contact: AFSM National Meeting, P.O. Box 4853, Santa Clara, Calif. 95054.

Aug. 24-27, Waldenwoods, Mich. – 1976 International Conference on Parallel Processing, sponsored by the IEEE Computer Society and the Association for Computing Machinery (ACM). Contact: Dr. Charles Elliott, Coordinator of Engineering Extension Programs, College of Engineering, Wayne State University, Detroit, Mich. 48202.

Aug. 27-Sept. 2, Atlanta – Urban & Regional Information Systems Association (Urisa) Annual Meeting. Contact: Ron Murch, Management Systems Development Department, City of Calgary, P.O. Box 2100, Calgary, Alta T2P 2M5, Canada.

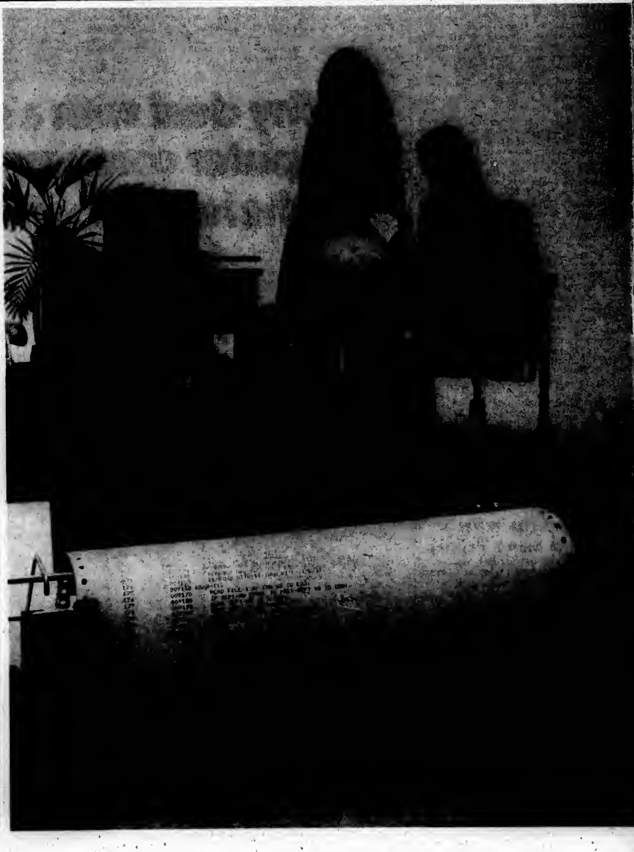
Sept. 1-3, Chicago – Annual National Electronics Conference and National Communications Forum, to be held concurrently by the National Engineering Consortium, Inc. (NEC). Contact: NEC, Oak Brook Executive Plaza #1, Suite 103, 1301 W. 22nd St., Oak Brook, Ill. 60521.

Sept. 7-10, Washington, D.C. – Compcon '76 Fall, sponsored by the IEEE Computer Society. Contact: Compcon 76 Fall, P.O. Box 639, Silver Springs, Md. 20901.

Sept. 13-14, Chicago – Metric Management Workshop, sponsored by the American National Metric Council (ANMC). Contact: George Buchanan, ANMC, 1625 Massachusetts Ave., N.W., Washington, D.C. 20036.

Sept. 13-15, St. Louis – Fifth Annual Retail Operations Seminar, sponsored by the National Retail Merchants Association (NRMA). Contact: Operations Division, NRMA, 100 W. 31st St., New York, N.Y. 10001.

Sept. 14-17, Los Angeles – Western Electronic Show and Convention (Wescon). Contact: William C. Weber Jr., Wescon General Manager, 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.



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After Three Collapsed Last Year

Early Warning System Spots Trouble in N.J. Banks

By Catherine Arnst
Of the CW Staff

TRENTON, N.J. – A computerized information system implemented here acts as an early warning device to spot troubled banks.

The system, which officials believe to be the only one of its type in this country, was set up in response to economic conditions that plagued New Jersey and in response to the precarious situation of some banks located here.

Within the past year, federal authorities have undertaken a probe into the collapse of three state-chartered banks and the workings of about 17 other banks.

Officials in the Department of Banking (DOB) hope the system will uncover problem areas in banks quickly so remedial action can be taken before a bank fails.

The proposal for the system was made in early 1975 by the DOB and programming began that spring within the Department of Transportation's DP center, which operates the system.

At the end of 1975, the system kept information on the 96 commercial banks and 20 savings banks in the state.

Twice yearly call reports, which are a statement of assets and liabilities, are submitted to the DOB and input into an IBM 370/145 along with earnings and dividends reports.

The computer then generates reports which contain information compiled from these sources of data. Parameters and ratios have been established within which a bank's performance must fall and each bank is compared to others within its peer group to measure its relative stability.

Prior to implementing the automated system, New Jersey compiled the reports needed by the DOB manually. This took approximately 62 man-hours to accomplish from the time call reports were filed. The DOB did not utilize earnings and dividends reports at all under the manual system.

"We didn't use the data then to find out if banks were in trouble. That wasn't noticed unless it hit us over the head while looking at the reports," according to Roger Wagner, deputy commissioner of the DOB.

Now reports are directed specifically to that area. When a bank is found to have a weak spot, that information is turned over to a bank examiner who visits the institution, Wagner said.

Major Hang-Up

"The major hang-up so far has been getting the call reports in quick enough," Frank Carr principal bank examiner, said.

However, reports were generated with the automated system two weeks after the last report was filed when it was first used in January, which Carr considers "a pretty significant breakthrough."

"With the automated system we have not only increased our input and the amount of output, but have decreased our leadtime," he said.

The DOB designed the system, which was programmed in Fortran by the Department of Transportation. Various outside packages were examined, including a Federal Deposit Insurance Corp. (FDIC) model, but "we decided to go our own route," Wagner said. "And we got off the ground very quickly."

Programming was started in April 1975 and the first test run was done in August. In January, the system was officially put into operation compiling the call reports filed at the end of the year.

Test, production and operation costs total about $1,200 per filing, which is done twice a year, Carr said.

More Data Wanted

A $12,000 modification in the program has been proposed becsuse the FDIC has changed the format of the call report and the program must be changed to accommodate it. With the new program, the DOB has asked that more statistics on individual banks be compiled.

"We are going to try for more sophisticated information all the time," Wagner said. "The key to a successful system is recognizing what data is needed."

The reports generated by the system are not made public although all the call, earnings and dividend reports are available to anyone, Wagner said.

New Jersey wanted an early warning system because it had more than the usual amount of economic problems, Wagner claimed. During the recession, loan classifications had increased more than 100% for two years in a row, he said.

Only one distributed processing system speaks Cobol. Sycor's.

Now your branch offices can use Cobol, the language of maxi-computers, with Sycor's 440 and 410 distributed data entry and processing systems.

That means you can do many vital jobs such as report generation, file listings, post data entry editing and file maintenance faster than ever before. Because they're done at the source, instead of on your large, central computer. And Sycor's Cobol capability is available at no extra cost.

With Sycor's Cobol, a subset of ANSI '74 Cobol, you can still have central control by doing all your program development on your host computer. Or test your programs and do compiling on a 440 or 410 in your branch locations.

Flexible Sycor systems increase efficiency.

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The Model 410 gives you the same big Cobol processing power as the 440 system for your smaller branches, at a stand-alone-terminal price.

For $516 a month on a three-year lease, the 410 provides 2.5 million characters of disk storage, 40k bytes of memory, a display station, communications and a 60-cps bi-directional printer. And fast, reliable maintenance from one of our 100 nearby service centers in the United States and Canada.

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Better yet, call one of our 32 conveniently located sales offices. They're in the Yellow Pages under "Data Processing Equipment."

Sycor puts computer power where the work is.

SYCOR

Editorials

Shades of the Future

The great IBM antitrust trial being held in New York City has taken a major step toward being held in an empty arena. The latest to abandon the scene is no other than Judge David N. Edelstein [CW, Aug. 2].

So attorneys for both sides appear each day and seem lost in the massive courtroom in Foley Square. Perhaps that is fitting, for many believe this trial is being forgotten in a society that prefers to deal with problems of the present rather than motivations of the past.

We can foresee some technical/electronic refinements in this case as it progresses, however. After the judge has adequately demonstrated that things can proceed smoothly without his presence, why not eliminate the litigants?

About six months from now, we can see the stage lights softly lit at the Foley Square courtroom. A cleaning person is silently sweeping the floor. In the front of the courtroom near the witness box, an IBM 3 equipped with a new audio interrogation/response feature is "questioning" a minicomputer/tape recorder system representing a government witness.

On the government side rests another mainframe that looks very much like a 370, but has been camouflaged with paint.

At regular intervals, the court clerk comes in to put a new spool of tape on the multidrive subsystem that has replaced the judge's chair.

Another clerk is conferring with an IBM 3 diagnostic expert. It seems the witness system has raised objections. The IBM CPU is creating electronic interference which is interrupting the logic commands being entered into the witness system by a government attorney at a remote terminal.

One feature has been added over the judge's bench. A huge counter now updates the ever-increasing cost of the trial in real time.

Other than that, little has changed and the trial drones on.

OS Users May Need Help

IBM's plan to drop support of OS/MFT and MVT to Class C [CW, July 5] had been expected by most of us for some time and shouldn't have been a shock to any user. There was no reasonable way in which IBM could continue support for the 360-oriented operating system indefinitely.

Ever since DOS/360 was effectively abandoned three years ago, users have been urging IBM to give them at least a year's warning before it cast them adrift. Now that the cutoff date has been set – and it's substantially more than a year from now for Release 21.8 – it's up to the users to prepare for the future.

Certainly, the Guide and Share user groups will continue to be supportive of their members.

Beyond that, there haven't been as many software packages to enhance OS as there were – and still are – to improve DOS. But the vendors and packages that are available may provide some help.

When DOS went to Class C, the Computer Lessors Association (CLA) set up a DOS Support Service for clients of the companies that make up that group. On the face of it, such dedicated support would seem to be unneeded by OS shops, which are typically larger and more sophisticated than their DOS cousins. And yet, there obviously will continue to be installations growing out of DOS and seeking something other than VS as their next step.

Perhaps now is the time for CLA or the software vendors involved with OS packages to take a look at how they can best help the user.

1976 OLYMPICS
COMPUTER CENTER
DATA INPUT STATION
INDIVIDUAL SCORING CHALLENGES
TEAM SCORING CHALLENGES
COUNTRY RANKING CHALLENGES
COUNTRY WITHDRAWAL REQUESTS
COUNTRY EXPULSION DEMANDS

Letters to the Editor

Dataproducts Expects Increase, Not Decline in Core Memory Sales

The article on Dataproducts in the July 12 issue of *Computerworld* stated that Dataproducts was phasing out of the core memory business.

I was interviewed for the information in the article, and our direction in the core memory business was misunderstood. Dataproducts is not phasing out of this business; in fact, this year will be a growth year for core memories in both revenues and profits.

The headline "Dataproducts Concentrating on Printers" was correct. Over 70% of our revenues are derived from line printers.

Last fiscal year, we did have a decline of core memory revenues to $13.5 million which was primarily due to recessionary pressures. A decline in revenues for one year does not mean a phase-out. We expect this year to be as good as any we have had in the past.

The predictions by many industry forecasters over the past few years that core memories were no longer going to be used are not true. The expected revenue increase by Dataproducts this year is because of our market concentration in areas where core memories have distinct advantages over semiconductor memories.

Dataproducts has always enjoyed a profitable position in the core memory business. We expect to remain profitable, and have made resource commitments to keep our dominant position in the marketplace.

Irving L. Wieselman
Vice-President, Product Programs
Dataproducts Corp.
Woodland Hills, Calif.

Data Past

Five Years Ago
Aug. 11, 1971

CHICAGO – One thousand attendees turned out for the 25th birthday of the computer at ACM '71 here. Association members wanted the Association for Computing Machinery (ACM) to spend less time on technology and more time on improving both the quality of information handling within the industry and the image of the industry and the computer outside the DP community.

– – –

MINNEAPOLIS – Control Data Corp. introduced its 921 optical character reader which used a helium-neon laser to drive the system. The device read at a speed of 1,200 document/min and cost $24,000 or $1,865/mo on a one-year lease.

Eight Years Ago
Aug. 7, 1968

WASHINGTON, D.C. – The telephone foreign attachments tariff remained in effect for another month because of a Federal Communications Commission (FCC) ruling that granted AT&T consideration of its appeal of the FCC decision to void the tariff. The tariff prohibited connection or attachment of equipment or devices to the public telephone system not authorized by the telephone companies.

– – –

WASHINGTON, D.C. – Three telephone companies entered the time-sharing services business while the FCC studied suggestions that the common carriers as a whole be prohibited from offering DP services. United Computing Systems, General Telephone & Electronics and ITT Data Services received a strong reaction from service bureaus because of alleged "advantageous position," the service bureaus said.

Grosch's Humor Lacks Punch

Like other intellectuals turned humorist, Herb Grosch suffers from the literary weakness that some of his attempts at humor confuse too many of us: we don't get the joke. An example was his July 19 column in which he seemed to be suborning the American Federation of Information Processing Societies (Afips) and its member societies, especially the Association for Computing Machinery (ACM), to fakery. It wasn't until third reading that I realized he must be pulling my leg.

He suggested that "without attempting to get broad membership concurrence, the associations . . . forward positions to Afips . . . which pieks testifiers for hearings and puts out a Heavy Press Release describing the submission as 'consensus of . . . societies' . . . The idea is to slide the papers upstairs quickly and quietly."

Grosch had to be kidding. Surely he knows that on most controversial subjects, certainly the issue of data communications policy, there can be no clear ACM consensus: most of us individual members who would be affected are ignorant of the substantive facts and diverse enough in our goals so that any meaningful "position" has to be that of a minority. The societies' and Afips' tax positions are well-protected by those realities.

Afips and its member societies might well get in trouble by attempting to influence legislation, particularly if some spokesman puts his foot in everyone's mouth by pretending consensus where none exists. Grosch's column itself ensured such nonsense would/should be instantly recognized and ignored or challenged.

This column was one more sympton of Grosch's itch to change the technical societies into what he calls "trade guilds," or what most of us call trade associations. He should not read his election as ACM president to be a mandate for that kind of change.

Herbert S. Bright
Bethesda, Md.

Copyright

We're in the middle of another cycle of the recurring discussion of patents and copyrights and trade secrets and registry of ideas. Every person in the computer business is affected, from the student who pays an exorbitant price for his textbook to the retiree who Xeroxes articles from *Computerworld*. There is an off-again, on-again, away-again series of decisions on software patentability. There is a vigorous recalcitrant movement among computer hobbyists, proud of its program piracies. And in the background, ominously threatening the stability of the hot-lead-and-printers-ink trades themselves, and their age-old products, is the generation of large amounts of information on evanescent media like TV screens, terminal CRTs, digital wristwatch faces, and the like.

I myself believe that the handiness, the relative permanence, the transferability, the authority of hard copy will preserve its use indefinitely. There will always be the sexy brochure, the detailed operating manual, the carefully typed legal contract, the airport rack of paperbacks. But there will be – has already been – a fantastic growth in new ways of transferring data.

Look at what we have: phonograph records, audio tapes, cartridges, cassettes, and computer-generated audio response; punched cards of many sizes and shapes, and paper, plastic and foil tapes of many formats; automatic typewriters, I/O and free-standing line printers, teletypes, consoles and terminals; black-and-white and color CRT displays; cylinder and flatbed plotters; COM devices of a dozen provenances; even computer Braille!

And copying devices, from ten-dollar hectographs and supermarket coin-in-the-slot copiers to room-sized monsters with choppers and bursters and decollators and collators: not only to copy locally, but to copy from originals a satellite-link away.

Let me run through one or two major dilemmas, beyond the obvious rip-offs we all recognize. Take the college professor: torn, he is! On the one hand, he writes textbooks and scholarly material, and receives sometimes rather substantial royalties. On the other, he and his students benefit enormously from easy access to other people's material, and especially from inexpensive copying; from ghetto dweller to ARPANET member, access makes life richer.

And another case, pointed out first by Calvin Mooers: IBM puts out a copyrighted manual describing either the hardware-level instruction code of a new machine, or the higher-level language and operating system. This manual clearly states it is to be used to help customers, paying customers, write programs to run on the machine concerned. Now an RCA or an Amdahl uses that manual to design a competitive machine which accepts customer programs – IBM-compatible, we usually say – and competes successfully for hundreds of millions of dollars worth of IBM business. Is that "fair use"?

All of this, and much more besides, is being hashed over again in Washington. I'm deeply interested. But I don't see any simplistic solutions; the problams of protecting proprietary software is so remote from the problem of whether CRT display of data violates copyright, and so on, and so on, that I believe an enormous, compendious, easily amended omnibus bill may be necessary.

When I was in the Department of Commerce I recommended the following subpolicy to Senate committee counsel: copyrighted material could be entered without hindrance into tamporary or permanent computer storage; it could be processed, substantially augmented or edited or reduced, and then output in any form without hindrance; it could be output for study and use (as, for instance, to choose alternate computer operating strategies without hindrance on transitory media such as cathode ray screens or regularly-destroyed console printouts, even in substantially unaltered form; on the other hand, to output sizable quantities of full text in permanent form, humanly readable – hard copy, we say – regardless of where the output appeared, would be a violation.

Wasn't much of a contribution, and in fact the recommendation was undoubtedly minced up in the great legislative grinder that operates on the Hill. My point is, dozens and dozens of such policy facets, reworded and circumscribed by pages of legalese, have to be adopted before a rational approach to copyright (let alone patent) rights in our age of modern technologies can be promulgated. Moreover, some mechanism to easily amend the law as new information capabilities flourish is vitally needed.

Finally, something like the social/economic device used to compensate composers and musical artists for commercial performance of their works will almost certainly have to be proposed and refined for our trade, and especially software. If every package could be tracked, and every use recorded, like every playing of Elvis' "Blue Suede Shoes," we'd have a new ball game indeed.

Herb Grosch

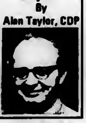
Graphical Method Checks Deeds-Type Check Digits

Check digits, except for the simple versions, are not easy to check. In production there are normally computers all set up to handle it, but during development of new systems there is an advantage in being able to know whether a check digit is correct quickly and accurately.

The Taylor Report

By

Alan Taylor, CDP



H. Block and A. Skough of the Swedish National Bureau of Statistics recently published some original work on this subject. Personally I am very grateful to them, because they not only caught an error in the Oct. 22 Taylor Report on the Deeds method, but also calculated a new table which permits the checking to be handled and demonstrated as easily as the original coding can be performed.

This table, which has the columns as inverse permutations of the rows of the reduction table of the Deeds method, appears on Page 4 of the report.

However, Block and Skough then went much further. They developed and illustrated a graphical method for checking the accuracy of the check digits of any of the Deeds type of check digits, which is something I had not realized could be performed.

The method uses nine tables for any particular basic permutation.

For example, one of the permutations they have studied (in place of the original Deeds number of 0496183275) is 0915243678. The tables this permutation gives rise to are shown in Figure 1.

These are used by starting with the original number, least significant end, in a single permutation called the START. Looking at the table to the right, find the tens digit of the number to be checked in the same row as the original units number. Now, turn Downwards and find tha hundreds digit in the next table in the same column as the tens digit.

Repeat this process of matching the digit in each decimal place with a digit in each table moving from table to table at 90-degree angles.

For a number with more than 10 digits, reenter the tables to the right of the start block at the column with the same digit as the number under the last table in the same column as the decimal place digit.

The check digit will be found under the table in the same column as the last decimal place digit.

This really is a very simple method – easier to do than to describe. It can handle any length of number, can be used by anybody and requires no computer – not even a pencil and paper.

There is a lot more the Stockholm people are doing, upon which I will shortly be commenting. But this checking method is really worth looking at in detail. Try it for yourself.

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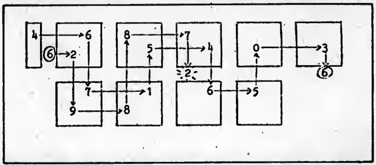


Figure 2. The tables are used by going through the number as illustrated above for tha number 788923056451764, from the least significant decimal place. Basically, one turns 90 degrees for every digit in tha number, and under the last row or column number the check digit is found.

START											
0	0	0	4	5	7	3	6	8	9	1	2
2	1	3	0	4	5	7	8	9	1	2	6
4	2	7	3	0	4	5	9	1	2	6	8
6	3	5	7	3	0	4	1	2	6	8	9
5	4	4	5	7	3	0	2	6	8	9	1
3	5	6	8	9	1	2	0	4	5	7	3
7	6	8	9	1	2	6	3	0	4	5	7
8	7	9	1	2	6	8	7	3	0	4	5
9	8	1	2	6	8	9	5	7	3	0	4
1	9	2	6	8	9	1	4	5	7	3	0
		0	1	2	3	4	5	6	7	8	9

0	8	1	7	6	9	2	4	5	3	0
6	0	8	1	7	2	4	5	3	9	1
7	6	0	8	1	4	5	3	9	2	2
1	7	6	0	8	5	3	9	2	4	3
8	1	7	6	0	3	9	2	4	5	4
9	2	4	5	3	0	8	1	7	6	5
2	4	5	3	9	6	0	8	1	7	6
4	5	3	9	2	7	6	0	8	1	7
5	3	9	2	4	1	7	6	0	8	8
3	9	2	4	5	8	1	7	6	0	9
0	1	2	3	4	5	6	7	8	9	

0	7	8	2	9	1	4	5	3	6
9	0	7	8	2	4	5	3	6	1
2	9	0	7	8	5	3	6	1	4
8	2	9	0	7	3	6	1	4	5
7	8	2	9	0	6	1	4	5	3
1	4	5	3	6	0	7	8	2	9
4	5	3	6	1	9	0	7	8	2
5	3	6	1	4	2	9	0	7	8
3	6	1	4	5	8	2	9	0	7
6	1	4	5	3	7	8	2	9	0
0	1	2	3	4	5	6	7	8	9

0	4	3	2	1	5	6	7	8	9	0
1	0	4	3	2	6	7	8	9	5	1
2	1	0	4	3	7	8	9	5	6	2
3	2	1	0	4	8	9	5	6	7	3
4	3	2	1	0	9	5	6	7	8	4
5	6	7	8	9	0	4	3	2	1	5
6	7	8	9	5	1	0	4	3	2	6
7	8	9	5	6	2	1	0	4	3	7
8	9	5	6	7	3	2	1	0	4	8
9	5	6	7	8	4	3	2	1	0	9
0	1	2	3	4	5	6	7	8	9	

0	2	4	6	5	3	7	8	9	1
5	0	2	4	6	7	8	9	1	3
6	5	0	2	4	8	9	1	3	7
4	6	5	0	2	9	1	3	7	8
2	4	6	5	0	1	3	7	8	9
3	7	8	9	1	0	2	4	6	5
7	8	9	1	3	5	0	2	4	6
8	9	1	3	7	6	5	0	2	4
9	1	3	7	8	4	6	5	0	2
1	3	7	8	9	2	4	6	5	0
0	1	2	3	4	5	6	7	8	9

0	6	8	3	5	7	9	1	2	4	0
5	0	6	8	3	9	1	2	4	7	1
3	5	0	6	8	1	2	4	7	9	2
8	3	5	0	6	2	4	7	9	1	3
6	8	3	5	0	4	7	9	1	2	4
7	9	1	2	4	0	6	8	3	5	5
9	1	2	4	7	5	0	6	8	3	6
1	2	4	7	9	3	5	0	6	8	7
2	4	7	9	1	8	3	5	0	6	8
4	7	9	1	2	6	8	3	5	0	9

0	3	6	9	7	8	1	2	4	5
7	0	3	6	9	1	2	4	5	8
9	7	0	3	6	2	4	5	8	1
6	9	7	0	3	4	5	8	1	2
3	6	9	7	0	5	8	1	2	4
8	1	2	4	5	0	3	6	9	7
1	2	4	5	8	7	0	3	6	9
2	4	5	8	1	9	7	0	3	6
4	5	8	1	2	6	9	7	0	3
5	8	1	2	4	3	6	9	7	0

0	1	4	9	8	2	5	3	6	7	0
8	0	1	4	9	5	3	6	7	2	1
9	8	0	1	4	3	6	7	2	5	2
4	9	8	0	1	6	7	2	5	3	3
1	4	9	8	0	7	2	5	3	6	4
2	5	3	6	7	0	1	4	9	8	5
5	3	6	7	2	8	0	1	4	9	6
3	6	7	2	5	9	8	0	1	4	7
6	7	2	5	3	4	9	8	0	1	8
7	2	5	3	6	1	4	9	8	0	9

0	9	1	5	2	4	3	6	7	8
2	0	9	1	5	3	6	7	8	4
5	2	0	9	1	6	7	8	4	3
1	5	2	0	9	7	8	4	3	6
9	1	5	2	0	8	4	3	6	7
4	3	6	7	8	0	9	1	5	2
3	6	7	8	4	2	0	9	1	5
6	7	8	4	3	5	2	0	9	1
7	8	4	3	6	1	5	2	0	9
8	4	3	6	7	9	1	5	2	0

Figure 1. The START block and the nina matrices shown ara all anyona needs to check the accuracy of Deeds-type check digits. These are set up for 0,9,1,5,2,4,3,6,7,8.

Letters to the Editor

Mark III Predates ADR Product 'First'

I have some comments on the article regarding Applied Data Research, Inc.'s (ADR) "firsts."

Informatics, Inc. began marketing its Mark I system in 1962. The system was described in a *Datamation* article of December of that year. This predates the ADR activity by three years.

International marketing of Informatics' Mark III system began in 1964, thus predating ADR's international activity by two years.

Sale of Informatics' Mark IV system alone, not to mention our Intercomm, Score, Life-Comm and other products, exceeded $30 million dollars by 1974, thereby predating ADR in that department by one year.

Informatics supports, maintains and improves its products on a regular basis, in the course of which we maintain a continuing relationship with all of our product users. Thus, ADR's program to do so is by no means unique.

John A. Postley
Senior Vice-President
Informatics
Woodland Hills, Calif.

'Dumb Westinghouse'

Regarding Herb Grosch's column, "Gerhard Neumann" [CW, July 5], "just dumb Westinghouse's" Nuclear Center has the world's largest commercial computer center, run by computer professionals.

Joel W. Williamson
Pittsburgh, Pa.

Authors Named

A column by Herb Grosch suggested programmers put their names on programs [CW, April 19]:

Grosch might be pleased to know that International Mathematical & Statistical Libraries, Inc., which distributes a library of over 300 routines to do mathematical and statistical computations, has done just this for over two years. Each routine bears the name of the person(s) responsible.

John Bolstad
Stanford, Calif.

GE Really Has Net

The headline on the July 19 letter to the editor "GE to Expand Also" gave me the impression *Computerworld* still didn't quite believe General Electric (GE) had a network.

GE has had a time-sharing network in Europe, Canada and the continental U.S. since 1969 and is the acknowledged pioneer in this regard.

MK III now services Japan, Australia, Singapore and all of western Europe from Scandinavia to Spain, Italy, Ireland and points between. All this, with the exception of Singapore, has been in place for several years.

Steve Salter
Pasadena, Calif.

DP Only a Tool

I agree with the conclusions in the editorial, "Learning the Hard Way" [CW, May 24], that drastic action must take place before bureaucrats will change anything and that too much information can be as dangerous as too little information.

But I don't extend this just to bureaucrats. This applies to *all!*

Let's remember that computers are only tools that assist people in accomplishing the required work.

Kenneth Erickson
Robbinsdale, Minn.

Former Clients Served

The article on point-of-sale (POS) system vendors in the July 12 edition of *Computerworld* was highly interesting to us as our firm has just begun a Retail Service Operation polling POS terminals.

However, I do take issue with the statement regarding the former customers of Androcor Division of Boeing Computer Services which CW reported were picked up by Service Bureau Corp. (SBC).

To my knowledge SBC was successful in obtaining only one of the former Androcor clients and we got the rest. These are all operational with us now whereas SBC is still converting the one client.

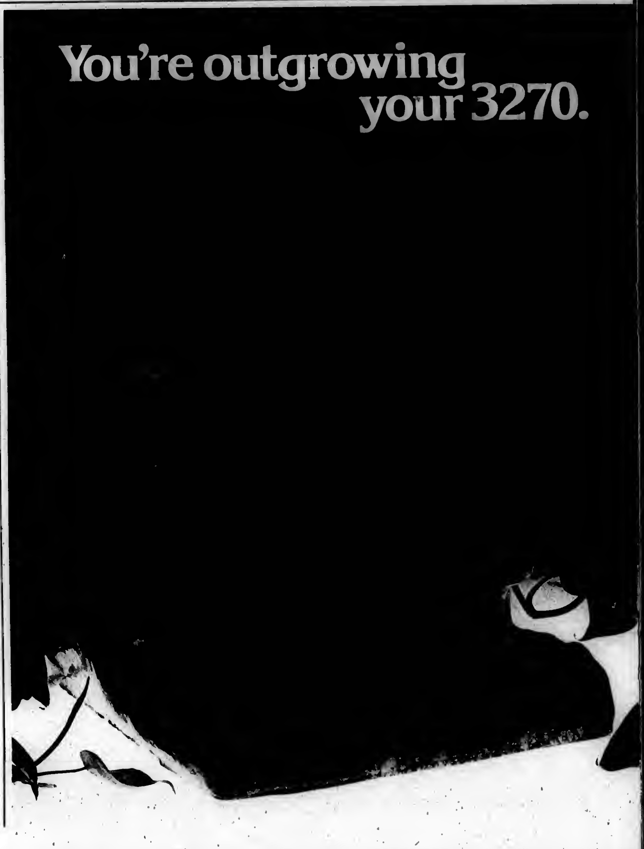
James A. Gross
President
Computer Associates, Inc.
South Bend, Ind.

Protecting the Guilty

Alan Schlustmeyer's letter [CW, May 24] berated John Kannarr's stand on "earned" data [CW, May 10]. When an individual defaults on a loan (Kannarr's example) or chronically writes checks for which there are insufficient funds on deposit that individual has indeed had benefit of trial – a trial in which he has, unassisted, convicted himself of financial irresponsibility!

Schlutsmeyer's "fundamental concept: due process" when it *really* works, does not protect everyone – nor was that its original intent. Its original intent was to protect the innocent. When it *really* works today, it protects only the guilty.

Rink Parker
Gulfport, Miss.



Systems Designers Must Keep Walls From Tumbling

. . . And in This Corner

By Kenniston W. Lord Jr.

Special to Computerworld

A friend with whom I used to share the lecture circuit once astounded me by telling a class, "Building a system is just like building a brick wall. You put in a footing and place the bricks in place course by course."

When I was introduced, I proceeded to dispute his remarks.

To begin with, in order to build a brick wall, there are some laws, natural and civil, with which we must contend.

And then there are some standards for the brick.

And the mason has a right to be able to rely upon these specifications.

Then take the mason. A mason must have gained some minimum amount of education and have undergone some minimum form of training. He must have served an apprenticeship under the watchful eye of a journeyman.

And before he is able to practice his skill independently for gain, he must demonstrate to some regulatory authority that he does indeed have that skill and experience.

Next, what about the wall? There are building codes and safety codes, rules and regulations to which the mason and the brick with which he works must conform.

The brick must conform not only to the laws of nature but also to civil code, for if it does not there is someone with the authority and the power to direct that the wall be disassembled and to make it stick.

Why? Because the brick wall user – the public – has a right to be protected from a violation of natural laws and civil codes, to say nothing of shoddy workmanship. It's just a simple fact that society has decreed its citizens will be protected despite their unawareness of that protection.

The public which is subjected to data processing abuse is afforded no such protection. An individual does not know who has data about him and why, but he knows that data does exist. He has no assurance that you, the DPer, took his interest to heart as you designed your system. He does not have any assurance whatsoever that the system you build will protect his life, health or property.

He knows that when he walks by that brick wall somebody has taken steps to protect him as far as possible. But he does not know that any similar steps have been taken in his regard by those who would computerize him.

Without belaboring the point, he does not know he will be in any manner protected when we DPers get through with him. I think he has a right to have that assurance.

For all the problems we have witnessed with other professions, one thing is abundantly clear – the standards employed tend ultimately to purge the unethical, incompetent and dangerous practitioner, for in the end the unsuspecting public will be protected, whether they recognize it or not.

In short, DPers may – and not too far into the future – be facing a people vs. computer backlash. Forewarned is forearmed. But forewarned and ignored will only increase the amount and scope of the backlash. The time simply is now to take the steps to find a way to place some form of mandatory controls upon the systems we build.

Forms of Mandatory Control

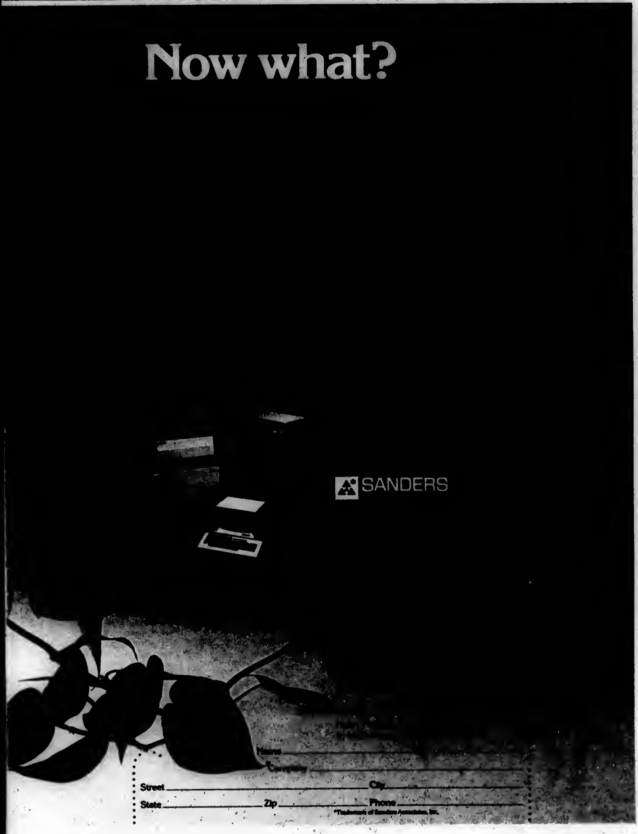
These mandatory controls may take one or more of several forms. It may happen in the form of civil approval of system design specifications, as in Berkeley, Calif. It may take the form of restrictive legislation, like that concerning privacy. It may take the form of educational standarda – minimum learning criteria dictated by a legislative body. It may take the form of mandatory auditing requirements for the use of systems. It may take the form of systems certifications under specialized cases.

It may take the form of people certification. Or it may take the form of licenses to practice, penalties under violation of that practice. And than, it might well take the form of the refusal of the public to let you treat personal data on your computer.

However you slice it, something is going to happen. It may be this year, next year or the day after you retire. For sooner or later the public, the brick wall user, is going to become suddenly aware it is sick and tired of being treated as a number, carelessly, callously and with indifference.

And when that happens, the public will become suddenly aware you have within your hands the power to maim, injure, cripple and perhaps kill it.

With that awareness, folks, you will not only lose a profession – you'll lose a job.



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Concentrating Only on Cost, Schedule Can Make Breakthrough a Breakdown

By Miles Benson

Special to Computerworld

Breakthroughs are sometimes not all they're cracked up to be.

I remember the software breakthrough which was apparently so large that its announcement bypassed the computing literature and went straight to *Business Fortune* magazine. And I remember the inside-the-computing-field horse laughs which accompanied the knowledge that the breakthrough dissolved swiftly into a "Project Which Failed."

To the best of my knowledge, I'm afraid, *Business Fortune* never corrected its error publically. But that's breakthrough biz, I guess.

The Sociology of Computing

The background for this particular breakthrough began in the early '60s when a leading hardware house, Marketronics, announced the latest birth in its second-generation family of computers.

The Marketronics 2410 was born without software, which is not of course unusual in the computing field. What was unusual, though, was that Marketronics had a plan to do something about that.

Marketronics research, concerned about the cost and schedule problems associated with software implementation, had come up with a solution. The 2410 was the pilot system on which the solution would be proven. And the solution was a software building system called Phoenix.

Now Phoenix was more than a set of software tools, although it was primarily that. It was also a philosophy.

And the philosophy went something like this: The problem with software construction is that it requires a lot of high-talent folk for a long period of time. The solution to the problem lies in building the talent into a set of tools so smart that a few low-talent folk can do the same job in a short period of time.

Stop laughing. Remember, this is the early '60s.

Back at the Marketronics ranch, the research folk fanned the managerial fires, and the Phoenix Software Implementation System emerged from the structure of the philosophy. Phoenix took a half-dozen or so man-years to build, but the stakes were high and Marketronics never doubted the wisdom of its investment (not during the implementation phase, that is).

Now, enter the 2410 computer and the first test of Phoenix and its philosophy. To compete in its chosen marketplace, the 2410 needed a large bundle of software – an Input/Output Processing System (IOPS), a macro assembler (MA), a Report Generator Utility (RGU) and a Cobol compiler.

Those were the basics. Get those out of the way quick, the Phoenix philosophy said, and Marketronics could get into building some application software which might support sales to specific industry customers.

And there was the real market potential of the 2410 on the line. Phoenix needed to work.

Get set for a surprise: Phoenix *did* work! MA was on the air and satisfying Quality Control in a couple of months. IOPS followed along behind a couple of months later. RGU was done at the same time.

And even complicated Cobol, to full corporate standards, took only eight months. Marketronics managers fairly danced with glee.

And that's when the *Business Fortune* article was published. The breakthrough was really a breakthrough. From hardware birth to full software system support in under eight months. That was worth bragging about.

The Fall That Pride Goeth Before came slowly to Phoenix. There was the usual number of system trouble reports (STR), but they didn't scare anyone.

Software quality wasn't the prime goal of this particular breakthrough – only cost and schedule were. And quality wasn't surprisingly low.

What *was* wrong with Phoenix, and with the 2410 software, didn't emerge until the STR situation stabilized.

IOPS serviced interrupts about as rapidly as Aunt Jemima flows through a pinhole.

MA used as many passes to assemble as there were user macros defined, and that meant assemblies usually had to be scheduled by users on weekends.

RGU, slowed by IOPS, produced reports only slightly faster than the clerks in the shop had been doing it by hand.

And Cobol – alas, Cobol – compiled so slowly that computer operator shift changes occurred in the middle of 90% of a typical user's compilations.

You've got to give Marketronics credit for one thing . . . It knew when to admit it was wrong. Phoenix usage, after an appropriate investigation, was halted.

Users were notified that 2410 software was acknowledged to be seriously inefficient and that it would soon be withdrawn in favor of newer deliveries.

Not surprisingly, though, no one notified *Business Fortune* of this turn of events.

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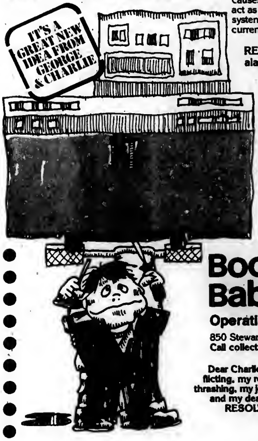
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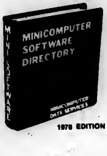

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Planning, Available 158 Eases DOS/VS-OS/VS Shift

By Don Leavitt
Of the CW Staff

LAKE SUCCESS, N.Y. – Some have called this town's name very appropriate for the personnel at the Chemical Bank's (Chembank) personal credit center here who recently completed conversion of a massive DOS/VS operation to OS/VS.

They not only changed operating systems and 1,000 program modules; they also moved the work from an IBM 370/145 to a 158 and added a new application in the process.

And the whole project was completed about a month ahead of time, according to assistant vice-president Lewis Berlent, who is in charge of the center.

Meanwhile, another group of Chembank people was shifting work from a second 145 and onto the bank's other major data center in New York City. Now both rented 145s have been returned to IBM.

The possibility of moving from the 145s was first recognized early last year when Chembank acquired Security National Bank on Long Island. Security had a 145 which it rented and a 158 which it owned.

Although hardware consolidation was a very obvious and desirable goal, there was originally some question on where the consolidated operations should be run, Berlent recalled.

The decision was made to stick with the two Chembank sites and to eliminate the separate Security operations. The owned 158 was to be moved to Lake Success.

All work not related to personal credit was moved from Security to Chembank's New York City center last year. Installation loan accounting operations, still handled in New York, were to be moved here and – "since it was better than ours" – the system used by Security was to replace the one used by Chembank, Berlent said.

Conversion of the workload at Berlent's center started last summer with a review of the on-line programs, including Master Charge credit-card processing. Two or three people were involved at first, "just getting to know the system" since it had to be rebuilt from self-contained operations to work under Chembank's "home-grown" teleprocessing monitor system.

There were 16 major on-line programs; all had to be revised to include reentrant code. Ten had to be rewritten because of file designs that would be inefficient under OS/VS, Berlent said, noting coding was begun heavily in mid-autumn.

Detailed work in planning the move of batch programs to the 158 began in January and was soon recognized as "more cumbersome" than the on-line work, though not necessarily as complicated.

JCL statements for every one of the 1,000 program modules had to be changed. That was "probably the biggest chore," Berlent said, but modification of programs with console display messages was another problem.

To eliminate as many messages as possible, the batch conversion team "decided to let the system decide what was important enough to tell the operator. When we encountered conditions that would have caused a message under DOS/VS, we went to an error routine," he said.

Unless the current condition exceeded a predefined threshold, the error was logged but no message was generated and no operator intervention was needed.

One of the toughest problems the group encountered was the changeover of the mortgage loan accounting package Chembank had acquired some time ago.

"We had to take it apart and 'unoverlay' it, for one thing. Changing all the I/O modules, which were in Assembler, was also tough," Berlent said.

Coding changes in the Cobol programs were generally not difficult, he acknowledged, since it was largely a matter of fixing Select statements and FD sections. Nothing ever happened to make his staff feel they had to call in outsiders to solve a problem, he added.

Having the 158 in place and uncommitted to production from March until June "certainly gave us a big boost," the vice-president said. The on-line conversion group worked days, the batch crew nights – with no interruption.

And the batch crew, in particular, learned to use TSO as a program development tool even though it took too much out of the system to use once production started.

The programmers used a double conversion approach since programs were subject to constant updating even while the conversion was going on. Once OS/VS versions were compiled, any changes in the DOS/VS programs still in production were also made in the OS/VS "copies."

But there was always the danger that some changes weren't picked up so, just before live work was to start under OS/VS, all the DOS/VS programs were again converted.

The whole project worked smoothly because "all our people wanted it to work" and because Berlent and his management crew pushed for a project checklist of tasks to be done before anything else started. And the programmers stayed with the operators around the clock for the first month of actual operations.

There couldn't be any unsolved problems. The 145s were shipped out the day after live work started.

'Dfast/VS' Frees Disk Space

FORT LEE, N.J. – Dfast/VS, a disk management package from Oxford Software Corp., allows DOS/VS users to work with any date-expired disk space as a partition-independent resource from which any type of file – except Vsam – may be allocated, the vendor said.

Based largely on Oxford's earlier Dfast, this package was developed "because, outside of the DOS/VS facilities available for allocating and managing Vsam files, IBM offers the user few tools for disk management," a spokesman claimed.

In addition to reusing "expired" disk allocations, Dfast/VS makes up for over-allocation of extents on live files by truncating sequential and prime area Isam file space to the end-of-file marker at Close time, he said.

The package also provides the ability to dynamically allocate both permanent and temporary file space on disks shared by two or more CPUs, the spokesman continued.

A feature called Public Space Management (PSM) reportedly allows the user to dynamically allocate file space across pack boundaries. With PSM, extents for a data file can be defined on a "pseudo-pack" which may consist of two or more real packs or portions of them.

Related capabilities enable users to "absolutely protect" a file from being accessed or to selectively prevent a file's use by anyone except the current user, Oxford said.

PSM also provides the means of defining which packs or areas within those packs are available for dynamic allocations.

Device-independent file handling, beyond facilities available from IBM, are also part of the system, Oxford said.

The package also includes a reporting module which generates statistics about the use of files under Dfast/VS control.

Dfast/VS ranges in cost from $225/mo to $350/mo or from $5,625 to $8,750, depending on options selected.

Oxford is at 158 Linwood Plaza, Fort Lee, N.J. 07024.

Datapoint Adds Cobol for 5500; Compiler Based on '68 Standard

SAN ANTONIO, Texas – A Cobol compiler introduced by Datapoint Corp. for its 5500 disbursed processing systems is an implementation of American National Standards Institute (Ansi) 1968 Cobol specifications "with selected features of Ansi-74 also included," the vendor said.

With the new software, programs can be compiled on a 48K Datapoint 5548 Advanced Business Processor with disk storage and executed on "any" 5500 processor with user-required peripherals, the spokesman added.

Ansi Cobol '68 facilities supported by the compiler include Nucleus, Level 1; Table Handling, Level 2; Sequential Access, Level 1; Random Access, Level 1; Sort, Level 2; Segmentation, Level 1; and Library, Level 2, he said. Several features from Level 2 of the Nucleus and the Sequential and Random Access modules have also been included, he noted.

Features from the 1974 Ansi specifications include various mathematical options; WRITE statement differences; and CALL and EXIT capabilities comparable to those in the Inter-program Communications module.

Reflections of '74

Support for software-based programming switches and allowance for more relaxed punctuation and more flexible comment facilities – all of which reflect Cobol '74 – are also included, Datapoint said.

File compatibility between Cobol and all other Datapoint languages and between Cobol on the Datapoint gear and Cobol on a central mainframe is also a design goal of this compiler, the spokesman added.

Transparent Management

Indexed sequential files are supported; dynamic allocation and deallocation of disk space under that and other access methods is transparent to the user, he said.

Users may license Datapoint's Cobol for a one-time charge of $2,500 or for $65/mo. Maintenance support and documentation costs an extra $20/mo under either plan. The software will be ready for distribution in September, the company said from 9725 Datapoint Drive, San Antonio, Texas 78284.

NTIS Reprints Study Of Basic Compilers

SPRINGFIELD, Va. – "A Comparative Evaluation of Versions of Basic" by Bennet P. Lientz, published in the April 1976 issue of the *Communications of the ACM*, is now available from the National Technical Information Service (NTIS).

The article compares 10 current versions of Basic with each other, with two earlier versions and with the proposed standard for minimal Basic [CW, April 12].

Eight pages long and cataloged as AD-A024 247/9WC, the study costs $3.50 (paper) or $2.25 (microfiche) prepaid from NTIS at 5285 Port Royal Road, Springfield, Va. 22161.

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'Profile' Pinpoints Program Problems Without Using Data Collected by SMF

LOS ANGELES – CACI, Inc.'s Profile II, designed to locate and eliminate bottlenecks in programs running under OS or VS environments, does not use IBM's SMF data as the basis for evaluations, its vendor noted.

Profile consists of two major components, a monitor program and a report generator. The monitor oversees execution of the user program to be analyzed, issuing timer interrupt requests and, at each interrupt, making an entry on a trace file, a spokesman explained.

The report generator reads the trace file and produces summaries of the sampling data collected by the monitor. The most significant output, according to CACI, is a histogram showing the distribution of CPU time utilization within a program.

Identifies Control Section

In contrast to some other monitoring packages, however, Profile identifies control sections and not just core locations in its histogram.

This makes the graph easier to use not only with Cobol, for example, where the user does not normally function at the core location level, but with relocating systems which place programs "almost anywhere they want," CACI suggested.

The output shows what is using the most CPU time and is therefore the most likely candidate for rework to improve the operation of the whole program, the spokesman added.

Profile requires no modification of the operating system, "nor does it in any sense usurp control from the operating system," CACI noted.

"Perhaps more important from a user standpoint," the programs being monitored require no modification either, the vendor said.

Perpetual use of the Profile II system is available for $8,600. A time purchase is also available for $280/mo for 36 months, CACI said from 12011 San Vicente Blvd., Los Angeles, Calif. 90049.

Master Key Gives Access To 'Cryptex' Coded Files

NEW YORK – Cryptex-MK from Bi-Hex Co. is a software security product designed on the same principle as a mechanical lock master key system, according to a spokesman.

The package was derived from the original Cryptex program, "but it really is far more complex," he added.

The system logic is said to let DP users in "any IBM-type operating system" make up their own cryptographic keys for enciphering any data regarded as private. The encoding can be applied at the record level, but not at the field level, the company said.

Data Passed

Keys and data are passed to the Cryptex-MK system by means of a called reentrant subroutine; the enciphered result is passed back to the user.

To retrieve the original data, the next user must supply the enciphered data and the same key used to encipher or the system master key.

The user's private key and the master key together form an 8-byte key which Bi-Hex described as similar in size to the data encryption standard promulgated by the National Bureau of Standards.

It is possible to change the system master key at will, the vendor said, without affecting any user's access to previously enciphered data. Master keys obsoleted by such a change cannot be used to access any data in the system, the spokesman added.

Cryptex-MK is seen by the vendor as "especially useful" in time-sharing environments in which individual users insist on privacy but the custodial responsibility of the network supervisor may require the possibility of unlimited access.

Cryptex-MK is available as a 2K object module supplied with tailored JCL and test program. The system costs $1,250 which includes two copies of the instruction manual and program support for 90 days.

Bi-Hex is at Suite 303E, 200 Park Ave., New York, N.Y. 10017.

ASI Course Aims at Vsam

ELK GROVE VILLAGE, Ill. – A multimedia course focusing on IBM's Virtual Storage Access Method (Vsam) and Access Method Services has been developed by Advanced Systems, Inc. (ASI).

The course includes seven videotapes, four audio tapes and guides for both the course coordinator and students, the company said.

"Vsam and Access Method Services" was designed for applications and systems programmers who create and maintain Vsam data sets and catalogs. It will also facilitate managers' and analysts' understanding of the capabilities of Vsam, according to ASI.

The training package lasts 22 to 24 hours and includes four hands-on exercises enabling students to execute Access Method Services jobs on their own computers, the vendor noted.

The course is said to include the latest features and changes of Access Method Services, incorporating the Independent Component Release used with Enhanced Vsam. A feature unique to the Enhanced Vsam, the alternate indexing concept, is also explained.

The course applies to any OS/VS environment; situations in which differences occur between VSI, VS2 Release I (SVS) and VS2 Release 2 and later MVS releases are clearly indicated, ASI said.

"Vsam and Access Method Services" is availble for purchase or as part of the vendor's subscription library, a spokesman noted from 1601 Tonne Road, Elk Grove Village, Ill. 60007.

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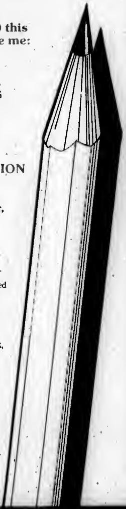

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- 13 Treasurer/Controller/Finance Officer
- 21 Director/Manager of Operation/Planning/ Administrative Service
- 22 Director/Manager/Supervisor DP
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 41 Application Engineer
- 42 Other Engineering
- 51 Mfg Sales Representative
- 52 Other Sales/Marketing
- 60 Consultant
- 70 Lawyer/Accountant
- 80 Librarian/Educator/Student
- 90 Other ______

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Advertisement

DP Dialogue

Notes and observations from IBM
which may prove of interest to
data processing professionals.

Distributed processing has stepped up the efficiency of warehouse operations at Wilson Sporting Goods Co.

Distributed Processing Links 25 Wilson Field Locations

Few companies today operate entirely out of one location. Even small firms are likely to have regional sales offices,. while larger businesses may have dozens of operating units scattered across the country. For such organizations, a distributed processing system may help bring about some notable operating efficiencies.

Wilson Sporting Goods Co. of Chicago, a division of PepsiCo, is an outstanding example. Wilson is both a manufacturer and distributor of sporting goods, with one of the broadest lines in the industry. The company recently realigned its distribution network and now has 21 sales offices, each of which stocks some inventory, plus 4 large regional distribution centers. An IBM 3790 Communication System links all 25 locations to a System/370 Model 158 computer.

In a distributed processing system like the 3790, the workload is shared between the central computer and smaller units called controllers, which act as small processors. In the Wilson network each location has a controller online to a cluster of terminals and a printer, creating 25 small computing centers with local data processing capability.

Typically, after an order is entered at a Wilson sales office, it is transmitted via the 3790 to the Model 158 which forwards it to the appropriate regional center or centers. As the order is being processed, Wilson's companywide data base—including open orders, shipped orders and inventory—is updated. Customer inquiries concerning order status can be answered quickly through any terminal in the network.

"Customer service has benefitted greatly with the 3790," says Phillip D. Matthews, vice president, distribution. "The time required to process and ship orders has been cut almost in half. All our sales offices now get order and inventory reports overnight, instead of two or three weeks later. And nine out of ten items ordered are filled on demand, without backordering. Overall, office and warehouse productivity rose 30%.

"The system has made possible much closer coordination between manufacturing and sales," he adds. "Since we are constantly up to date on order volume, we can adjust production in advance to meet demand.

"All these factors, plus our new physical distribution facilities, have culminated in a reduction of approximately $10 million in our total inventories—which in turn has increased cash flow and reduced our need for working capital."

The 3790 runs under Systems Network Architecture (SNA), an advanced IBM teleprocessing structure that unifies communications networks for greater efficiency and easier growth.

Alyeska Develops a Total DP System in Record Time

When the Alyeska Pipeline Service Company was formed in 1970 to supervise the design and construction of the Alaska pipeline, many of the details of the project were still a big question mark. The only absolute certainty was the immensity of the challenge, particularly in the area of management control. The job called for the development of a total data processing system which would be flexible enough to handle very rapid growth.

Every aspect of the planning, construction and administration of the 800-mile pipeline must be fully documented to meet Federal environmental and regulatory requirements. That includes keeping track of inventory consisting of everything from Arctic outer gear to spare parts, managing a work force which swells to over 20,000 during the summer and providing accounting information for thousands of separate parts.

From the beginning, Alyeska has relied on various IBM computers to help handle the information. As the project progressed, the quantity of accounting data mushroomed quickly. "We went from processing less than 100 invoices a day out of our temporary offices in Seattle in 1974 to handling between 2-to-3,000 invoices daily on our Model 145 with VS/1 today," says Art Potter, manager of systems and computing. "Our online data base now includes over 2,500,000 records and it's still growing."

The toughest part of planning the system, according to Potter, was anticipating future data processing requirements without specific guidelines. "It was like compressing a 10-year corporate history into two years." says Potter, "We had to get every application up within a few months, because the actual pipeline construction was moving ahead so quickly."

Alyeska's system includes data processing equipment at five major construction sites and the Model 145 in Anchorage. Overall, the system must keep track of all the bills submitted to Alyeska by nearly 10,000 subcontractors. Each week, a performance report on pipeline progress is sent to the eight oil companies that own Alyeska for review on costs and efficiency.

Ultimately, records of all the expenses associated with the pipeline will go to the Interstate Commerce Commission (ICC) which is responsible for determining the rate of return the oil companies will be permitted to earn on their investment. Every expense will have to be documented and justified for the ICC.

When the pipeline is finally completed Alyeska will be responsible for the total operation of the pipeline and terminal facilities at Valdez, Alaska. Currently new data processing applications are being developed to support these pipeline activities. For example, sensing devices along the pipeline will transmit information to a computer in Valdez, which in turn will communicate with the System/370.

"One thing is certain," says Potter, "we could never have coordinated a project of this size without the computer. The financial accounting alone would have been a nightmare. We are confident that the experience our staff has gained working under the Alaskan constraints will provide us with the ability to develop the applications required when the oil starts to flow."

A pipe casing is welded on the Alaska pipeline. To help manage the $7 billion project, the Alyeska Pipeline Service Company is using an IBM System/370 Model 145.

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In Texas, a Giant Data Base Produces King-size Results

What insurance company has insured every military man who has walked on the moon? What's the largest property and casualty insurance company headquartered in Texas? Who is San Antonio's biggest private employer?

The answer to all three questions is the United Services Automobile Association. USAA is a unique member-owned cooperative, with over a million policyholders. Most members are active or retired commissioned officers in the armed forces and their dependents—and they're stationed all over the world.

The USAA home office is one of the world's largest and most efficient office buildings.

USAA has no agents. Its policyholders communicate with it mostly by mail and telephone.

To help meet their insurance needs—automobile, home, life, property—with efficiency and dispatch, USAA relies on a comprehensive IBM computing system built around an immense data base. It's one of the largest data bases running under IBM's IMS (Information Management System) used by any property and liability insurer anywhere, with 4.8 billion characters of online storage. The system runs on an IBM System/370 Model 168 computer.

The data base is remarkable for more than size. Unlike the insurance industry practice of indexing by policy numbers, USAA indexes by account (policyholder) numbers. Account numbers are cross referenced to policyholder's names. An average of three active policy numbers are carried under each account number.

This innovative policy of "a name, not a policy number" has some unusual advantages. A complete profile of any member's policies and other data can be flashed on any of 275 visual display terminals, both at the San Antonio home office and at five regional service offices around the country. Much of this data can be updated online, with the rest processed overnight.

And the transactions are copious. They include a daily average of 36,000 automobile data entry transactions, 24,000 policyholder online updates, 80,000 general inquiries, plus 5,000 hard copy batch document requests.

Data entry procedures, both for written forms and terminal display, are sequenced so that what appears on the terminal screen parallels the information on source documents. Compared with previous methods, this new online data entry system has reduced required keying time by 30% and operator training time by 60%. The transactions are edited as they are entered, thereby reducing the number of errors coming into batch processing by over 30%.

"Probably the best way to measure the cost effectiveness of our data processing operation is to compare the USAA underwriting expense ratio with the rest of the insurance industry," says Col. Martin Fishel, senior vice president, computer services. "Each year, USAA reports one of the lowest expense ratios in the industry. Our computer systems are a major factor in keeping these expenses down."

Bell Helicopter Gets a Lift from Computer-Aided Design

A helicopter rotor spins at 300 revolutions a minute as its turbine engine runs at 6,000 RPM. A multistage transmission, designed and manufactured by Bell Helicopter Textron, accomplishes a twentyfold reduction to provide lift for the craft. That capability alone makes it a very complex mechanism, but at Bell there is an additional requirement: the transmission must be able to run dry of oil for thirty minutes and survive.

That level of performance requires very precise design parameters. Bell's engineers have been using the Fort Worth company's IBM System/370 Model 168 to help produce reliable, cost-efficient helicopters. Much of the designing is done by engineers who interact directly with the computer via twenty-five IBM 3277 and 2741 terminals which are linked to the Model 168 under the Time Sharing Option (TSO) and OS/VS-SVS.

"With interactive computing, we've been able to increase the productivity of many engineers by a factor of four," says Joe Red, chief of scientific and technical computing. "By evaluating more options in the same time, they can minimize technical risks."

At Bell, computer-aided design is used to model everything from human factors, like legroom and headroom, to helicopter "survivability" under the most turbulent conditions. The company has developed over 500 specific application programs which run the gamut from designing the smallest gears to simulating the flight characteristics of the entire aircraft.

The computer is also used to formulate the "egg shell" configurations—the geometry of an aircraft's skin. In the manufacturing area, the computer keeps track of manpower requirements, operations plans and parts production schedules.

"Interactive computing and a comprehensive data base," says Red, "have helped us design and produce rotorcraft with the classical aerospace virtues—maximum strength, minimum weight and as much payload as possible."

The final touches are being applied to a helicopter at Bell Helicopter Textron in Fort Worth. The aircraft was designed with the help of computer simulations.

Multiprocessing Ups Availability at UOP

"With our corporate computing load increasing by 37% a year for the last several years, system availability had become critical." So says Steve Bloch, director of corporate computer services for UOP, Inc., explaining the company's recent move to an IBM multiprocessing (MP) system.

UOP, (formerly called Universal Oil Products Company) headquartered in Des Plaines, Illinois, is an engineering-oriented company which designs and builds petrochemical process and pollution control systems, and manufactures their engineered components. A major subsidiary constructs refineries. Its System/370 Model 158MP serves users in 18 divisions in the U.S. and Europe, plus several non-UOP companies.

In the multiprocessing system, two "tightly coupled" central processors back each other up to insure system availability. A single control program under the Multiple Virtual Storages (MVS) operating system automatically allocates work between the processors, dynamically assigning the load for maximum work throughput and best utilization of all resources.

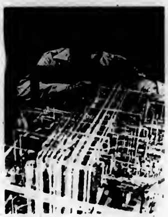
"Certain of our applications—such as shop order control—are synchronized with physical operations," Bloch explains, "so computer availability is vital. That's why we wanted the backup facilities and automatic error recovery of the multiprocessing system."

In a three-shift, six-day-a-week operation, Bloch notes, the system has been available more than 99.5% of the time.

Engineering productivity is also crucially dependent on computer availability, he adds. Most of this work is unscheduled: engineers simply enter linear programs or other large-scale calculating jobs at will, via remote terminals in 22 locations.

This variability of demand was an important factor in the choice of a multiprocessing system. The UOP system solves difficult scheduling problems in sufficient time to avoid conflicts, eliminating most manual scheduling.

Engineers at Des Plaines use IBM's Time Sharing Option (TSO), which permits them to interact directly with the computer, completing their solutions while seated at visual display terminals. TSO also enables engineers to validate input data before initiating computer runs—preventing costly reruns and shortening turnaround time.



Computer applications in plant design are growing fast at UOP. This engineering model is of a new process plant.

The data processing department itself uses TSO to enter and test programs under development. In this application, Bloch asserts, TSO has increased programmer productivity by 62%.

Bloch says, "The multiprocessing system has been remarkably flexible, absorbing wide fluctuations in volume. It's given us excellent availability while responding well to our increasing demand for interactive computing."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

76-4

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Original Forms Too Complex

'Son of Hipo' Proposed As Easier Charting Vehicle

By Joseph T. Rigo
Special to Computerworld

Concepts and Techniques

Let's face it. Hierarchy plus input, processing, output (Hipo) charts are great, but they are so complicated to create and maintain that no one uses them.

Hipo charts were developed by IBM. They can be enormously helpful as tools for structured system and program design and for documentation.

They graphically display the inputs to an operation, the processing functions and the outputs. The operation can be almost anything from a computer program to a master plan for housebreaking your dog.

Hipo charts work beautifully as documentation for complex operating system programs. They work equally well as part of the functional specifications for routine commercial applications.

They can be understood by almost anybody: programmers, bank presidents and even systems analysts.

Project managers like Hipo charts. They are willing to pay any size internal billing rate to get a trained technical writer to produce them.

Everyone Likes Them

And there's the catch. Everyone likes Hipo charts – provided someone else will do the work.

The problem is that Hipo was invented to meet the needs of a complicated systems programming environment. The most complex version of Hipo is the only one available.

Hipo is cram full of symbols. It has big white arrows to show the flow of data, big black arrows to mark entry points and exits and narrow arrows for pointers and notes. It has circles and squares, big boxes, little boxes and all the standard flowcharting symbols.

A person must have a nontrivial degree of skill to draw the charts in the first place. And it takes a great deal of skilled drudgery to keep them up to date. At least one new chart has to be drawn from scratch for every significant change in specifications.

Attempts to Automate

There have been some attempts to automate the process. Clint Jurgens and Dick Olson of Sperry Univac in St. Paul described one effort at the ACM '75 conference last fall.

They modified a software package that normally produces electronic circuit diagrams. Their Hipo charts look like wiring diagrams for your television set, but they do the job, and they are easy to update.

In most places, the work must be done by hand.

The amount of required, repetitive labor is one reason Hipo is not widely used. Another is that a routine commercial application simply doesn't need all the power available with the full assortment of circles, squares, boxes and arrows.

Consider a simplified approach. Call it Son of Hipo, or Hipo Jr.

For illustration, assume a standard master file update program. On the left side of the page, put a list of inputs: the master file, a transaction file and perhaps a table of codes used in processing.

On the right, put a list of outputs: the updated master file, a couple of reports and a parameter to be passed.

Put a great big box in the middle. It is for a list of processing functions performed (or to be performed) by the module.

A simple arrow connects each input item with the first processing function that uses it. Another arrow connects a processing function with the output it creates.

Plenty of Room

There is still plenty of room on the page for miscellaneous text. The text includes identification of called and calling modules, job and procedure names and references to file and record layout forms as necessary.

Joseph Rigo, president of Sysdoc, Inc., a New York-based documentation consulting group, described the accompanying article as "sort of an answer to Ed Yourdon's piece [CW, May 31]."

The result is a programmer's version of the flowchart that is customarily produced for the data center operations staff. The main difference is it emphasizes processing functions.

The chart is easy to update. It can be maintained on a standard text editor. For best results, include it as comments in the program listing. If it is in the listing, maintenance programmers are more likely to use it and keep it up to date.

This approach has an important byproduct. It introduces everyone to the fundamentals of Hipo charts.

The arrows, boxes, squares and circles are still available. They can be added as needed when a more complex design application comes along.

In the meantime, people may start using Hipo. It really does work.

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TALK WITH THE INDUSTRY LEADER.

DP Leaders Must Stop Fire Fighting, Start Managing

By Jack Stone

Special to Computerworld

A new opportunity has developed for computer center managers to impact their total organizations, not by further advances in DP systems and technology, but by leading the way toward new programs of human relations and personnel development – helping to build a new "quality of life" in American business and government organizations.

DP management today is in a rare position of gaining top management support in addressing the center's personnel situation and setting an example for the rest of the organization. And why shouldn't it be the DP manager's role?

While each article I have written thus far has discussed a selected topic related to DP human relations, they can all be summarized in a short list of major action goals center managers must embrace if they are to accept the challenge of becoming leaders of people as well as leaders of technology.

Peopleware

Goal 1 is an end to the disruption. There simply is no operating department in American organizations today whose day-to-day activities are so filled with turmoil and crisis as the production-oriented computer center. Although serenity seems always just around the corner, the fact remains the pace has been hectic for over a decade!

There are those who say that "fire-fighting" is the natural order of DP operations and that the effectiveness of DP systems would wither away in a sedentary climate.

However, I do not accept this thesis, simply because over the long run the disruptive environment does not permit DP personnel to complete assigned tasks to their own levels of achievement and excellence.

Turbulence in operations erodes motivation and denies full satisfaction of accomplishment; it encourages poor performance and inefficiencies. To end disruption, DP management will be required to take strong and unpopular stands with top executives.

Management may be forced to request the deferral of new hardware/software until currently installed systems are adequately debugged; the delay of new, critical applications until those currently in operation are found acceptable to users; or a substantial increase in personnel to meet existing development and production commitments.

In net, it is necessary to stop overcommitments to production, premature release of systems in development and understaffing of key projects, three of the primary causes for disruption.

More Leadership

Goal 2 is new leadership capabilities for the DP management team. Most DP managers and supervisors view their responsibilities as technical and operational in nature and give little consideration to their managerial responsibilities as professional leaders.

Many DP managers come to mind who need development in the principles of effective leadership: a simple understanding of and sensitivity to the unique human characteristics of each employee; personally conducting skills training of employees; counseling of subordinates to improve job performance; finding ways to enhance employee motivation; applying creative talents to solve personnel problems; building mutual respect and confidence through communications; or taking steps to change employee attitudes.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Selected letters will be published in Computerworld, *along with commentary by Stone, in a column beginning shortly.*

Letters should not exceed 500 words and should include the name, title, organization and address of the sender for acknowledgement purposes. This information will be treated as confidential and withheld from publication unless authorized for release by the sender.

Superior supervisory skills are mandatory for long-term success of the center. Counseling and training in supervisory leadership are essential programs for the future.

Development Programs

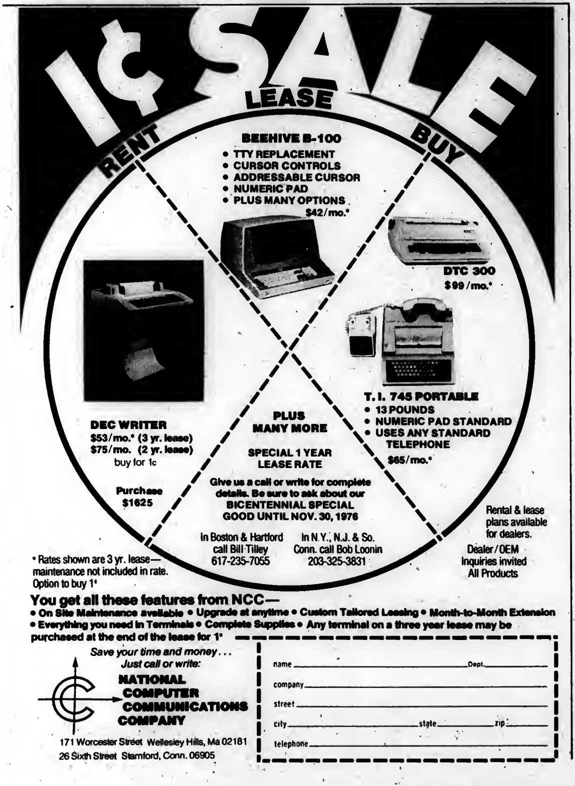
Goal 3 is an effective development program for each employee. Most DP people want to grow and produce to the maximum of their capabilities, probably more so, I believe, than any other segment of the American working population.

And why shouldn't we? Although the industry and the marketplace have enjoyed a phenomenal expansion since their beginnings, most of us believe the really serious expansion is yet to come.

Yet, the minds of the rank and file of DP personnel are filled with despair when relating to nontechnical matters of personal development, opportunity and job satisfaction. Literally everyone I have talked with has expressed serious dissatisfaction with the job, grave misgivings about management and important concerns about their organization. The levels of personal achievement have fallen well below the levels of personal aspirations, DP people feel they have worked hard to advance the capabilities of their organization through new DP systems, but that management has not responded in kind by developing plans for their career success.

Each employee seeks a roadmap for the future, based on individual career goals, with alternate pathways to higher level technical or supervisory positions. Each person needs clear statements and current information about job opportunities throughout the organization, including those outside of DP, plus experience, education and training requirements for such jobs.

Each individual wants to participate in all the training that is available, expecting the firm will either provide it in-house or pay for outside services.



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Equipment Compatible With SDLC

Adoption of ADCCP Expected to Spark New Terminals

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – When the Advanced Data Communications Control Procedure (ADCCP) is finalized by the American National Standards Institute (Ansi) as a U.S. data link control protocol, it will probably trigger the introduction of compatible terminal equipment.

The ADCCP standard has been under consideration by Ansi for several years. Originally it was an IBM concept, but IBM has now backed Synchronous Data Link Control (SDLC), so ADCCP is expected to become the link control protocol used by non-IBM terminal suppliers.

At least three major DP suppliers – Burroughs, Control Data Corp. and Univac – are known to be developing terminal equipment compatible with ADCCP in its present format. Digital Equipment Corp. has a bit-oriented protocol that is similar to ADCCP.

The relationship between IBM SDLC equipment and ADCCP equipment is not yet clear, but in general the ADCCP terminals will probably operate without major problems within an SDLC environment.

On the other hand, the SDLC equipment may not be totally compatible with ADCCP nets, according to Gerald Shutz, chairman of the Ansi X3S3 subcommittee that is working to bring in a final ADCCP standard.

Shutz described the relationship of ADCCP and SDLC as being similar to the relationship of a station wagon and a car – the station wagon can do everything the car can do, but the car can't do everything the station wagon can do, he explained.

Even though several vendors apparently are planning to introduce ADCCP terminals, the standard is not yet finalized. Standards efforts proceed slowly, and Shutz said a final ADCCP standard could still be as much as a year away.

Goes Further Than HDLC

The standards efforts on ADCCP go far beyond SDLC, however. In fact, ADCCP goes further than the Higher Level Data Link Control (HDLC) proposal of the International Standards Organization (ISO).

The significance of HDLC is that it is close to the X-25 standard proposal currently being implemented in several international packet-switched networks, including the U.S. Telenet system and the Canadian Datapac.

The X-25 proposal now has the status of a CCITT recommendation, and HDLC answers parts of the X-25 proposal that have not yet been resolved, a standards expert said. CCITT will probably meet early in 1977 to come up with a more definitive version of X-25.

There is "almost compatibility between them all unless something goes wrong," Shutz said. A user operating with an ADCCP terminal will probably be able to interface with networks that utilize an X-25 protocol, but even this is not totally certain because there is no ACDDP terminal yet available.

The Burroughs Data Link Control (BDLC) is presently one of the data link control procedures closest to ADCCP in its current form. BDLC "follows ADCCP," according to the standards source.

A number of non-IBM terminal suppliers are waiting to introduce terminals when ADCCP reaches a final form. These ADCCP devices are expected to have a higher level capability than IBM SDLC terminals.

'Cast in Conerete'

At present the X3S3 committee is balloting on ADCCP. Once this step is completed, the standard will be considered by the Ansi X3 committee.

After X3, the Board of Standards Review gets to consider ADCCP; the standard will then be published.

But users may not have to wait quite that long. If X3 gives its approval, the standard "is pretty much cast in concrete" and vendors will probably begin to introduce their ADCCP terminals. All that vendors would have to do at that point to meet the ADCCP protocol would be to add some software or firmware to their equipment designs.

And most of the network carriers, including those with packet-switched networks, intend to interface with ADCCP equipment. For users, the data link protocols are slowly evolving into standards; once that happens, terminals will follow.

Portable Units Increase Salesmen's Selling Time

CHICAGO – Salesmen for a tobacco and confectionery distributor located in nearby Countryside are reportedly gaining extra hours of selling time by employing electronic ordering terminals to write and transmit their daily orders.

The terminals allow S. Bloom's salespeople to bypass the paperwork and driving time previously necessary to get their daily orders to the warehouse by a 6 p.m. deadline, according to Steve Bloom, the firm's vice-president.

S. Bloom's salespeople are using terminals to enter their orders instead of driving back to the warehouse each evening to deliver them.

The company is using Source 2100 data entry terminals from MSI Data Corp. "The most significant advantage of the MSI electronic ordering system is that our field salesmen now have the additional time to sell our merchandise," Bloom said.

Bloom wholesales and distributes tobacco products, smokers' aids and candy items to approximately 2,200 retailers in the metropolitan Chicago area. The competitive nature of this type of distribution industry demands overnight processing and next-day delivery of all orders, Bloom noted.

Bloom's salespeople carry the unit into the field with them and either key in the order data at the retail store or directly after the visit while sitting in their cars.

Most salemen telephone the recorded order information to Bloom's DP center twice a day via the Source 2100 terminals to an MSI Systems IV receiver with one receiving line. The data receiver can be equipped with four or more lines if necessary.

An entire salesman's order can be transmitted at 120 char./sec to the receiver over ordinary telephone lines in a call which normally takes less than two minutes. Bloom salesmen used to spend hours on the highways each evening driving to the warehouse to deliver their orders, Bloom said.

The System IV receiver automatically verifies all incoming orders. When recorded on the receiver's magnetic tape, the data is ready for direct input into the company's IBM 3/10 system.

Order information is fed into the computer for processing by 8 p.m. the same evening. Complete invoicing and picking documents are then printed, and the warehouse can begin picking the orders by 10 p.m. By 6 a.m., Bloom's delivery trucks can begin their routes.

Salesmen are now carrying an order list which describes the company's entire product line. This list replaced mark-sensitive coding forms which carried only 60% of Bloom's product line.

Bloom expects to see a dramatic increase in line volume as a result of the system. "I expect with time the increase can easily reach 5%, which will be a substantial volume increase," he said.

IBM Terminal Has Multileaving

WHITE PLAINS, N.Y. – IBM has introduced a version of the 3777 remote job entry (RJE) terminal that includes a binary synchronous multileaving capability and a 1K-character gas panel display.

Designated the 3777 Model 2, the terminal can operate at speeds up to 9,600 bit/sec, print at speeds up to 1,000 line/min and read cards up to 400 card/min, IBM said.

The binary synchronous multileaving gives users the ability to include in one transmission block the data that can be sent to more than one I/O device; this is accomplished by including various control blocks within a transmission block, IBM explained.

The multileaving feature is generated at the host mainframe, which produces a terminal object card deck. This deck is then loaded into the Model 2. The multileaving was previously used by IBM on the 360/20 Submodel 5 workstation.

The multileaving runs with ASP, JES2, JES3 and RSCS and with the VS1, VS2 and VM/370 operating systems, IBM said.

A typical 3777 Model 2 with 3202 Model 3 printer, 400 card/min reader, gas panel display and required attachments costs $1,682/mo under the 24-month Extended Term Plan (ETP). Standard under the Monthly Availability Charge (MAC) is $1,927/mo and the purchase price is $65,385.

The gas panel display is an optional item priced at $90/mo ETP, $106/mo MAC and $3,600 purchase; the multileaving is a no-charge item. First deliveries are scheduled for the first quarter of 1977.

Let's talk about a brand new Terminal

Here it is! The *new* AJ 832. This new printer terminal combines high speed with versatility, reliability, and operating convenience. There are plenty of features as well, for example:

- A 256-character buffer memory
- ASCII, EBCD, and Correspondence Codes in one
- 30 or 45 cps throughput
- 17 key numeric pad with programmable function keys
- High speed plotting and plotting software, too
- APL keyboard

There are many options available too, such as pin feed platen or forms tractor, side shelves, and fan-fold paper trays.

We have a nationwide sales and service organization to stand behind every new AJ 832, and you have the choice of purchase or lease (month-to-month if you wish).

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DEC Unveils Interface Series

MAYNARD, Mass. – Digital Equipment Corp. has introduced a series of communication interfaces for its PDP-11 systems.

There are three units in the series: a single-line high-speed synchronous interface called the DMC11, a single-line multiprotocol synchronous interface called the DUP11 and a low-cost asynchronous 8- and 16-line multiplexer called the DZ11, DEC said.

The DMC11 is designed for high-speed links between PDP-11s using the DEC Digital Data Communication Message Protocol (DDCMP). The DDCMP functions are implemented in hardware through use of a high-speed microprocessor

This arrangement permits high-speed operation (56 kbit/sec or 1M bit/sec) over coaxial cable between CPUs located in the same facility, according to DEC. For operation over common carrier facilities, the DMC11s can be interfaced to synchronous modems at data transmission rates up to 19.2 kbit/sec.

The DUP11 is described as the first of a series of communication interfaces with multiprotocol capabilities. It is capable of handling bit-stuffing protocols such as Synchronous Data Link Control (SDLC) and Higher Level Data Link Control (HDLC).

The DZ11 multiplexer interfaces 8 or 16 local or remote asynchronous terminals or modems to PDP-11 systems.

The DMC11 high-speed synchronous interface is priced from $2,145, with deliveries scheduled for September. The DZ11 multiplexer is priced at $2,100 for an 8-line version and $3,400 for a 16-line version; deliveries are scheduled to begin by the end of July. The DUP11 multiprotocol interface is priced at $1,375.

Data Entry Units Serve as Core Of Retailer Inventory Service

LOS ANGELES – A large computer service bureau based here provides specialty retail store chains a retail inventory management service which depend on data entry terminals for input of daily salea transactions.

"We've developed a highly sophisticated system that tells retail store management everything about the movement of store stock," according to Bob Yauney, Retail Division manager at Silton Data.

"A simple eight-digit code describes every piece of merchandise in inventory. This code number allows our computer to follow the movement of each individual garment from the time of wholesale purchase up to the time it is bought by the consumer."

Silton's retail chain clients receive computerized reports that analyze every aspect of their retail operations from merchandise movement to salesperson performance.

The company's Retail Inventory Management System (Rims) enables retailers to eliminate out-of-stocks, optimize store inventory for turns, reduce marked-down merchandise and alleviate the problems of slow movers occupying too much of store display space.

By numerically labeling specially printed pricing tags with the code number – which describes the garment by manufacturer, style, size and color – Silton's Burroughs Corp. B4700 CPU can chart the movement of each individual piece of merchandise on a daily basis.

Helps Spot 'Movers'

Turning merchandise is crucial to the retail garment business. Maintaining a fluid inventory maximizes margin of profit and brings a favorable return on investment. Slow movers, on the other hand, are dead money – and usually these items get unloaded at marked-down prices to clear floor space for new merchandise.

Computerized reports help management spot "movers" in time to get reorders in and have them delivered to turn more merchandise. The reports pinpoint good and bad turn covers.

Checking vendor performance is also a useful feature of the reports. If a certain product line accounts for 5% of a retailer's sales, but represents 30% of his inventory, the retailer can adjust his purchasing decision to fall more in line with his sales.

Silton Data decided to complement its inventory reporting system with MSI Data Corp. Source 1100 data terminals because most specialty retail chains aren't in an environment suited to more expensive point-of-sale (POS) cash register terminals, Yauney said.

Unlike large department stores with 50 or more cash registers in each store, the average specialty retail store is a one-register environment, he explained.

Additionally, the length of time usually required to make a sales transaction at a POS register is eliminated by using the data terminal syatem, Yauney said.

"With the terminal in the store, the manager can enter his sales data at any time simply by keeping a portion of the sales tag at the time of the sale. He is not restricted to inputting data at the time of the sale," he said.

At the time of sale, the salesperson removes a portion of the garment tag with the numeric identification code and a space for sales identification number, which is recorded for commission purposes and analysis of sales performance.

At the end of each sales day, the manager or assistant enters the information on the sales tag and transmits it to Silton's DP center.

Device Switches Modems To Either of Two Channels

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Model 8506-D selector switch packaged in desktop configuration.

The 8506-D is used to switch the 25-pin EIA RS-232 or CCITT V.24 interface to either of two outputs.

Utilizing the 8506-D, one modem may be switched to either of two front-end-processor data channels or to either of two data terminals. The unit may be used to switch a data channel from an on-line modem to a backup modem or for switching from a leased line modem to dial backup.

The switch coata $105 and delivery is 30 days from IDS at 100 Nashua St.; Providence, R.I. 02904.

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Operating in the 3211 mode, the DOC 2250 prints 10% faster than the 3211. The DOC 2250 costs less than half as much as the 3211. The DOC 2250's integrated microprocessor controller eliminates the need for a separate controller. And because the DOC 2250 has built-in, comprehensive microdiagnostics, maintenance can be done off-line without tying up the host system.

The DOC 2250 also offers: buffered vertical format control; fully-buffered print line; operator-changeable character arrays; Universal Character Set Buffer (UCSB); up to 6-part forms; paper slew up to 100 inches per second; power cover; power stacker.

The DOC 1800 offers all the features of the DOC 2250, but at a reduced printing speed. And a reduced price.

The 1403 compatibility feature allows both models to operate in the 1403 mode. Your CPU will think it's working with a 1403. You'll know you're getting a 2250 or 1800 lpm printer for just about the cost of an 1100 lpm printer.

The read/punch side of the Subsystem (the DOC PC 6000 Reader and the DOC PC 50 Punch) recognizes the same command set as the IBM 2540. All data and control signals transferred between the host and the PC 50 and PC 6000 pass through a subsystem microprocessor controller built into the PC 6000. Utilizing Documation's own patented riffle-air pick and stack system, the PC 6000 reads 1000 cards per minute and stacks them in one of two stackers. Options include 51 Column Card Read and Optical Mark Read.

The PC 50 Punch Model 3 nominelly punches 50 cards per minute; Model 4 punches 100 cpm. The PC 50's microprocessor controller enables it to detect and correct punch errors automatically without operator or host system intervention. With the Pre-Read feature Model 3 reads 300 cards per minute, Model 4 reads 400 cards per minute. Other PC 50 options include a 51 Column Card read/punch feature, an interpret feature, a second input hopper to enable off-line reproduction of card decks; e Reed Column Eliminate feature and Optical Mark Read. Off-line, the PC 50 will gang-punch, reproduce and interpret, eliminating the need for extra pieces of equipment.

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Under FBI Contract

Calspan Makes Fingerprint Matching a Hardware Job

By Nancy French
Of the CW Staff

BUFFALO, N.Y. – Law enforcement came one step closer to reading, classifying and matching fingerprints automatically with a new piece of classification hardware demonstrated by Calspan Technology Products, Inc. here recently.

Under a contract from the Federal Bureau of Investigation (FBI), Calspan has speeded the classification process previously performed by software by making it a hardware function, according to John Jones, a spokesman for the FBI's Identification Division.

The new product, which classifies fingerprint cards at about 600 card/hour, is known as Fingerprint Classifier System (Fics).

Fingerprints are classified and matched according to two general characteristics: ridge directional flow and the location of and relationship between the print's minutiae, according to Jones.

But before a fingerprint can be classified by Fics, it must be read and registered, Jones explained. With hardware already developed by Calspan and manufactured by Rockwell International, Inc.'s Autonetics Division, a print can be read using a flying spot scanner and system that digitizes the ridge directional flow and minutiae locations.

Fics then classifies each fingerprint according to one of the 116 classifications established by the FBI's National Crime Information Center.

Fics then makes an overall numerical classification for the fingerprint card by designating the particular combination of classifications for the 10 individual prints on the card, Calspan said, and the print is stored in a data base.

Search and Matching Software

To match a new print against those already on file, the system reads and classifies the new print and then matches it against the data base using search and matching software also available from Calspan, Jones said. Thus the print need be searched only against those prints whose classification numbers indicate general similarity, Jones said.

While the prototypes of the Finder hardware still being tested by the FBI were built and delivered by Calspan in 1972, five production models were built for further testing by Rockwell International under a separate contract, Jones said.

By changing the card handler from s semiautomatic to an automatic model, the FBI-Rockwell production models work about three times faster than the prototype, Jones said.

Although the major difficulties of automated fingerprint identification have been overcome, the FBI is still testing and does not anticipate converting to an automated identification system before 1981 or '82, Jones said.

At present the FBI's fingerprint file contains 21.4 million fingerprint cards for individuals under the age of 80, Jones said. FBI officials do not intend to convert all these cards; plans call for reading and digitizing only those of individuals under 55 years of age, according to Jones, thus reducing the number that must be converted to 14 million.

"Hopefully we'll have a portion of the system up and running in about 1978," he estimated.

Although the FBI program is moving slowly, Calspan is forging ahead with a somewhat different system for large cities and state identifications bureaus that is said to be able to match latent fingerprints – those obtained from the scene of a crime.

Unlike the system designed for the FBI, Calspan's slower, smaller scale matcher does not require alignment of the two fingerprints being matched.

To match a fingerprint lifted from the scene of a crime, the Fingermatch system puts the latent print on a CRT screen where a technician traces the minutiae on the screen with a light pen.

This procedure takes from four to six minutes, a Calspan spokesman said, but once the print is drawn and coded, Fingermatch compares the new print against 10,000 prints – or 1,000 sets of 10 fingers each – in one minute, he said.

Since a city police department may have only 5,000 to 10,000 prints in its data bank, the print can be matched in a minute or two, he indicated.

The lifter portion of the system, consisting of the screen, light pen and a small processor, sells for $21,900. The search/match portion of the system is priced at $119,700, Calspan said.

Calspan Engineer Thomas L. Leising operates the firm's automatic Fingerprint Classifier System (Fics). After the print is read and digitized by a companion unit previously introduced by the firm, Fics locates the minutiae shown on the monitor and then assigns the print to one of 116 federal classifications for storage in a data bank.

In the Used Market—Part 2

Maintenance an Important Factor

By Sonny Monosson
Special to Computerworld

One of the most important factors a user must consider in a used computer transaction is the status of maintenance on the equipment slated for sale.

Self-maintenance is a rarity in computer usage.

Although maintenance alternatives are available from independent sources, the vast majority of computer users (except in the case of minicomputers) rely totally upon those services supplied by the original manufacturer and delivered under the terms of the standard, full-coversge maintenance agreement.

The manufacturer's common practice is to offer the maintenance agreement in support of the equipment itself, as opposed to support of the customer. The maintenance agreement is normally interpreted as being automatically extended to any subsequent owner, but must nevertheless be verified as a condition of sale.

Absolute Necessity

To date, transference of the maintenance agreement is an absolute necessity for purchase, and equipment offered for sale should be wsrranted for acceptance under a standard maintenance agreement.

The only way such a warranty may be obtained is to request it from the original supplier. The seller should request an inspection for resale purposes and a written statement from a responsible source (for example a branch manager or customer engineer) that such equipment is validated for continuance under a normal maintenance agreement in areas where maintenance service is otherwise supplied by the manufacturer.

The machine involved should be further certified as to the operability of all installed options (which may or may not be currently used) and the installation of all engineering change orders of a mandatory character normally provided as a portion of the maintenance agreement.

Reconditioning Needed?

Since reconditioning is not generally required (except for a few vendors) as a condition of maintenance continuity, the

(Continued on Page 28)

Forms Stacker Ends Bank Delays

NEW YORK – A forms-stacker device is easing the pressure on the DP section of Bankers Trust Co. here to get the checks that are deposited each day, along with their reconciled printout listings, to the New York Federal Reserve Bank by its deadline.

Bankers Trust must float, or cover out of its own funds, checks its customers draw against checks deposited from other banks until those checks have been deposited in the Federal Reserve.

"The object is to keep the float as low as possible. If we miss those deadlines because listings aren't available or the computer breaks down that's avoidable float. The extent to which float can be avoided is what the management of the section is graded on," according to Mike Menditto, the bank's check processing manager.

In July 1974, when the bank moved its operations center (through which all checks are processed) to a new installation and installed five Burroughs Corp. 9243 1100 line/min printers, a problem developed that threatened to cancel out much of the benefit of the new installstion.

The new printers' higher speed, combined with the already high skip rates inherent in printing the check reconcilement listings, was causing the continuous fan-fold forms used to tangle and misfold. Delays were being caused in processing check listings and were particularly severe during critical peak periods.

Operators were spending 10 to 15 minutes per hour just folding and reorganizing the listing stacks as they came off the printer, Menditto said.

Installed Forms Checker

To solve the problem, Bankers Trust installed an adjustable Formstacker – a power-drive forms puller and stacker from Advanced Terminals, Inc. It installed one on a two-month trial basis and

(Continued on Page 28)

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The Altair 8800b is a second generation design of the most popular microcomputer [illegible] the Altair 8800. Built around the 8800A microprocessor, the Altair 8800b is an open-ended machine that is compatible with all Altair 8800 hardware and software. It can be configured to match most any system need.

MITS plug-in compatible boards for the Altair 8800b now include: 4K static memory, 4K dynamic memory, 16K static memory, multi-port serial interface, multi-port parallel interface, audio cassette record interface, vectored interrupt, real time clock, PROM board, multiplexer, A/D convertor, extender card, disc controller and line printer interface.

MITS peripherals for the Altair 8800b include the Altair Floppy Disc, Altair Line Printer, teletypewriters, and the soon-to-be-announced Altair CRT terminal.

Introductory prices for the Altair 8800b are $840 for a kit with complete assembly instructions, and $1100 for an assembled unit. Complete documentation, membership into the Altair Users Club, subscription to "Computer Notes," access to the Altair Software Library, and a copy of Charles J. Sippl's Microcomputer Dictionary are included. BankAmericard or Master Charge accepted for mail order sales. Include $8 for postage and handling.

Shouldn't you know more about the Altair 8800b? Send for our free Altair Information Package, or contact one of our many retail Altair Computer Centers.

[illegible]

altair 8800-b

Interface Bows

ALTADENA, Calif. – The Kennedy Co. Model 1629 half-duplex interface is said to provide complete operational control without mainframe processing between Kennedy buffered tape systems or any RS-232C-compatible terminals and buffered transports.

The system allows off-line key-to-tape or tape-to-tape conversions via hardwires or telephone lines with modems at rates from 110 bit/sec to 19.2 bit/sec, the firm said.

Three transport/controller configurations accommodate varying remote collection requirements.

Tape speeds range from 10- to 125 in./sec, with 9-track data densities of 800- and 1,600 char./sec. Seven-track densities are 200-, 556- and 800 char./sec.

The Model 1629 is priced at $1,650 with volume discounts available from the firm at 540 West Woodbury Rd., Altadena, Calif. 91001.

Maintenance Important in Used Mart

(Continued from Page 25)

process may stop at this point. However, the seller should also solicit an estimate of reconditioning or refurbishing costs, in case the buyer is interested in this type of information.

The seller also should request an itemization of specific work required to bring the machine to the level of acceptability required by the maintenance agreement.

Reconditioning is not normally done prior to sale, except by equipment dealers, but is done, where required, at some point in the transfer from currently operative installation to a new user's installation.

The most convenient reconditioning services are those supplied by the original manufacturer, but several competitive reconditioning centers are now operated by independents.

The buyer sometimes opts for reconditioning, but the bulk of observed equipment transfers supported by the continuing maintenance agreement have occurred without it.

Where no significant overhaul is required, reconditioning sometimes occurs for purely cosmetic purposes. This is often a good time for factory (or field) installation of options and/or features desired by the new user.

Where the seller is not a current subscriber to his supplier's maintenance agreement, the situation is somewhat different, although the procedure is essentially the same. The same manufacturer contact should be made for purposes of obtaining an estimate for placing the equipment under a maintenance agreement.

The seller should likewise expect the estimate will be reasonably supplied by a reputable manufacturer who is potentially interested in future service revenues as well.

Should the hardware be deemed not acceptable for a future maintenance agreement or require very costly rework, the seller should solicit a detailed itemization of all work required for submission to an independent maintenance or reconditioning organization.

In summary, the seller must normally warrant to the buyer that the equipment is certified as eligible for a resumption of the manufacturer's maintenance agreement.

This generally poses no problem, since the only known cases where maintenance has been refused involve equipment for which maintenance services have already been expressly discontinued (a relatively rare phenomenon in the computer industry).

Every computer vendor treats maintenance continuity differently, and those who buy and sell used computer equipment should never assume a common industry practice exists – because in maintenance it doesn't.

Part III will discuss the methods a user has available to him to sell his equipment.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.

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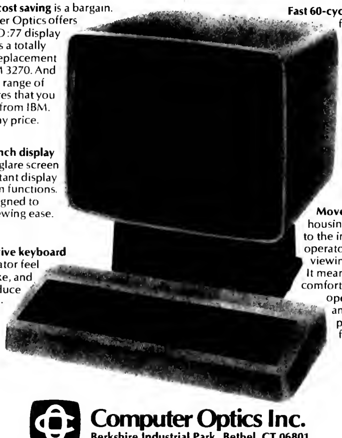

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Forms-Stacker Device Stops Bank Delays

(Continued from Page 25)

now has four.

"Its amazing so simple a piece of equipment could handle a problem that was driving us all up the wall," one operator said.

Formstacker operates by enabling forms leaving the printer to stack into a wire tray that lowers automatically as the forms fold in. A set of power rollers pulls the forms down through the upper part of the stacker, preventing printer jams, while rubber-covered "fingers" suspended by chains prevent the forms from billowing.

When forms reach a certain height, the next fan-fold in line trips a limit switch that indexes the tray downward. Thus, printout forms always stack at the same height level.

Automatic Alarm

An automatic alarm sounds when the tray is full and its open-sided design allows the operator to remove the printed stack from any of three sides. The unit can be moved from one printer to another to accommodate peak loads.

The key advantage of the four $1,000 units has been the ability to fully utilize the speed of its new printers in meeting check processing deadlines and cutting float to a minimum, Menditto said. Documenting time savings, operators claim operation of the four printers equipped with Formstackers is speeded by 20% at peak periods because of the elimination of misfolds and paper tangles.

The Formstacker units were also selected for their ability to cope with 1,800 line/min printer currently under consideration by the bank.

"If and when we go to an even higher speed printout operation, I have no doubt our Formstacker units will handle the load efficiently, Menditto said.

MDS Users Form in Capitol

WASHINGTON. D.C. – An independent society of Mohawk Data Sciences Corp. (MDS) users has been formed in the Capitol area to exchange hardware/software techniques and ideas on how to exploit the full capabilities of MDS systems.

Information on the Mohawk Users Group (MUG) is available from Barnett, U.S. Erda, Mail Stop CA 145, Washington, D.C. 20545.

Mini Bits

IEEE/CS Seeking Papers For November Symposium

TORONTO – A call for papers covering all aspects of minicomputers and microcomputers and their applications has been issued by the IEEE Computer Society (IEEE/CS).

The papers will be presented at a symposium here November 10-11.

A 200- to 250-word abstract should be submitted by September 1 to the symposium chairman. More information is available from Mini and Microcomputers, P.O. Box 3243, Station B, Calgary, Alberta, Ca. T2M 418.

Floating-Point Unit Fits 8080s

BERKELEY, Calif. – North Star Computers, Inc. has a floating-point arithmetic unit for Intel 8080-type microcomputer systems.

Consisting of a single printed circuit card, the unit performs add, subtract, multiply and divide on BCD-format floating-point values, with up to 14-digit precision under program control, the firm said.

The system costs $499 from the firm at P.O. Box 4672, Berkeley, Calif. 94704.

Cache Memory Works With PDP-11s

ST. PAUL, Minn. – The Minntronics Co., Inc. Model 45 cache memory was designed to be used with Digital Equipment Corp. PDP-11/45 and 11/50 minicomputers, according to the vendor.

The unit consists of three printed circuit boards and an optional power supply that plugs into available DEC Fastbus slots.

The Model 45 feaures an on-line switch as an aid in running benchmark tests as well as hardware checkout, Minntronics said, adding installation of the memory takes about 20 minutes.

The system is priced at $6,940 for a limited time. Minntronics is at 2975 Furness St., St. Paul, Minn. 55109.

HP Triples I/O Channels of 9825

PALO ALTO, Calif. – An I/O expander that triples the number of I/O channels available for the HP 9825 programmable calculator from three to nine has been introduced by the Hewlett-Packard Co. (HP).

The 9878A I/O expander has seven I/O slots and comes with a 6-ft. cable with an integral I/O card to plug into one of the three 9825 I/O slots.

Two of the expanders may be plugged into a calculator at once, the firm said.

The expander costs $1,200 from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Captures 'Original Keystroke'

Newspaper System Saving $628,000

By Esther Surden
Of the CW Staff

RALEIGH, N.C. – Two newspapers here said they have some news of their own to report: a minicomputer-based system is saving them more than $628,000 annually in operating costs.

"Our objective was to capture the original keystroke," Frank A. Daniels Jr., president of the News and Observer Publishing Co., said of the system which handles and stores all copy from its origin to final phototypesetting at the *News and Observer* and *The Raleigh Times*.

The company investigated several systems before choosing a Digital Equipment Corp. mini-based configuration because it was the "most flexible system available at the time we were looking," Daniels said.

Systems Functioning

The system "has been in-house for three years and functioning the way we want it to function for six or seven months," he added.

Fifty CRT terminals serve both of the newsrooms for local copy entry, editing and headline writing; eight more are used to set classified display advertising copy. Wire copy is also captured and joins the stream of jobs for editing and output.

So far the company has invested $1.2 million in equipment for editorial and typesetting functions. About $200,000 was spent for cold-type conversion and about $800,000 went for a DEC Typeset-11 system.

The Typeset-11 includes a PDP-11/45 CPU with 128K of main memory, magnetic tape, two 44M-byte disks, two line printers, interfaces for the wire services and 16 terminal subsystems.

The remaining $200,000 was invested in a PDP-11/45 for the business office. This machine can also act as a backup for the Typeset system.

It doesn't seem as though there is "ever a stop to it," Daniels said, referring to changes to be made to the system. For example, the reporters and editors would like more CRTs, and the company is thinking of expanding the system in the future. Additional CRTs will require a larger front-end system, he noted.

Much of the savings achieved by the conversion took place in the composing room, where a former roster of 101 foremen, typographers and technicians has dropped to 57, and in the proofroom, which now employes four full-time and three part-time proofreaders vs. 14 and three previously. Nearly all departures were accomplished through retraining and/or transfer, voluntary retirement or resignation, Daniels said.

Savings in Salaries

The current annual payroll saving from this change is estimated at $628,500; with a further drop to 40 composing room personnel expected by the end of 1977, the 1978 payroll savings will probably amount to $724,500, excluding new contracts or salary increases, he added.

Times reporters write local stories at the CRTs and queue them to the city desk for evaluation and editing. The city editor passes them, on queue, to the slotman who adds page, length and headline instructions to the files.

Copy editors call up the stories on CRTs, edit and write headlines according to the directions and queue the stories to a "backreader," or a final checkpoint. Upon his approval he types a simple command on his CRT that sends each story through justification and hyphenation and on to the phototypesetter.

At the larger *News and Observer*, stories follow a similar route, although more editors are involved and 10% of local copy is still written at typewriters.

The company faced a problem in supplying full electronic capability to both

(Continued on Page 30)

EAI Minihybrid for Simulation Combines Digital, Analog CPUs

WEST LONG BRANCH, N.J. – Electronic Associates, Inc. (EAI) has a small-scale, integrated hybrid computer system called Minihybrid for simulation purposes in educational, biomedical and industrial applications.

The system offers the I/O and stored memory of a digital unit and the high-speed parallel mathematical computation power of an analog processor, the company claimed.

Minihybrid has the ability to solve sets of up to 12 differential equations at the same time, a spokesman added.

The system processors are the EAI 185 parallel analog processor which features analog computational modules and analog and digital trunks and an EAI Datapacer digital processor with up to 32K words of 16-bit core memory, hardware multiply/divide, 64 priority interrupts and power fail protect.

The system features a hybrid communications interface with 60 analog/digital channels and a Teletype ASR-33-compatible teletypewriter for digital I/O.

The Minihybrid can be expanded to include an alphanumeric/graphic CRT, an X-Y plotter and additional digital, analog and interface capabilities, the spokesman noted.

Software for the system includes the Datapace operating system. A handbook provided with the unit details the principles of transforming equations into programs by interconnecting the necessary computing modules, EAI said.

The basic system with 16K digital processor, 133K floppy disk, EAI 185 parallel analog processor, hybrid communications interface and a teletypewriter costs about $35,000, the company said from West Long Branch, N.J. 07764.

16-Port Link-200 From Randal Designed for Business DP Users

TORRANCE, Calif. – The Randal Data Systems Link-200 system accommodates a maximum of 40M bytes of disk storage, 65K characters of memory and 16 ports for multiterminal time-sharing operation, the firm said.

The Link-200 is compatible with the other members of the firm's Link family and is programmed in Business Basic, the firm noted. It runs under the Randal Timesharing Operating System.

Application programs available for the Link-200 include accounting, payroll, word processing, text editing and inventory entry and control. Communications, remote job entry (RJE) and data entry packages are also available.

Also introduced with the Link-200 were industry application packages for the lumber industry and for medical or dental practice management.

A basic Link-200 system with 32K of memory, 10M characters of disk and a CRT costs $20,000 or can be leased for about $450/mo.

The system can accommodate printers with speeds of up to 600 line/min, printing terminals, 800- and 1,600 bit/sec magnetic tape, card readers and IBM, Univac and other vendors' communications/RJE packages, the firm claimed.

Randal is located at 365 Maple Ave., Torrance, Calif. 90503.

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Napacomp Turnkey Reduces, Analyzes Data

VALLEJO, Calif. – A turnkey minicomputer designed to analyze, reduce and display data and the functions of data is available from Napacomp Corp.

The mini, designed for industrial, laboratory and military applications, "looks at gross data," manipulates and takes the functions of data, fits curves to the data or function and analyzes it, the firm said.

Hardware for the system includes an Interdata 8/16 minicomputer with 65K bytes of memory, a moving-head disk, CRT, hard-copy unit and RS-232 interface.

An optional tape unit is "strongly suggested" for the system, a spokesman noted.

The basic system costs $54,000 including the tape unit and specialized software.

Some of the options available include additional disk, card reader and a plotter.

The system features control of all operations via input from the CRT/keyboard, on-line selection and/or algebraic transformation of data, on-line data base management editing capabilities and interactive control and specification of output data, Napacomp said.

The vendor is at 601 Sacramento St., Vallejo, Calif. 94590.

Wang Adds Word-Process Family

TEWKSBURY, Mass. – A family of microprocessor-based word-processing systems, the System 10, 20 and 30 has been introduced by Wang Laboratories, Inc.

The modular systems, configured in various arrangements of a CRT-based workstation, disk and 40 char./sec daisy-wheel printer, contain an Intel 8080 processor in each of the devices, according to a Wang spokesman.

The controlling microprocessor unit is located in the diskette unit and has a 16K memory associated with it, he added. The units are connected by coaxial cable, he noted.

The disk can store from 200,000 char. or 80 pages to 10 million char. or 4,000 pages, the firm said. The systems feature insert/delete/move instructions for characters, words, lines, paragraphs and pages. Operator prompts are displayed on the CRT.

Automatic half-spacing, page numbering, hyphenation, pagination, paragraph indent and centering as well as document merge are among additional features, Wang said.

A System 10 with a workstation, system diskette and 40 char./sec printer costs $12,000; the System 20 with workstation, system diskette, archive diskette and 40 char./sec printer costs $18,400; the system 30 with a workstation, 10M-byte disk, archive diskette and daisy printer costs $30,000 from Wang at 836 North St., Tewksbury, Mass. 01876.

Disks Fit Nova

MOORESTOWN, N.J. – Tri-Star Computer Systems, Inc. has 40M-, 80M- and 300M-byte disk subsystems for Data General Corp. Nova minicomputers.

Included with each subsystem is a controller, drives, power supply interface and cables; up to four drives can be accommodated by each controller, Tri-Star said.

An 80M-byte subsystem costs about $17,000 from the company at 304 Harper Drive, Moorestown, N.J. 08057.

System Saves $628,000 /Year

(Continued from Page 29)

the *News and Observer* and *Times* staffs while keeping newsrooms separate. The system supports a maximum of 32 terminals, and for a while the company faced a choice of combining the newsrooms or buying a second computer.

But, as Daniels noted, Raleigh's two papers, although under common ownership, thrive on a competitive spirit. "Separate news departments make for better newspapers," he said. "Physical separation keeps them honest and creates a sense of pride."

To permit installation of the extra 26 video terminals, production director Ivan Mims designed a switchboard to permit connection of CRTs in one newsroom when those in the other newsroom are not in use. Thus, when editorial deadlines pass for the *Times* and pairs of terminals are shut down, corresponding pairs in the *News and Observer* newsroom are placed on-line.

Editors claim the system's biggest advantage for them is in gaining time for breaking stories and having greater editorial control of the product, and Daniels agreed with them.

"We can handle a late story in a third of the time it took before," *Times* managing editor Michael T. Yopp said. "We have been able to get last-minute stories into print that we would have had to skip otherwise."

Lab's Mini Increases Gathering of Test Data Tenfold

SAN ANTONIO, Texas – A minicomputer at the Southwest Research Institute (SWRI) here is gathering 10 times more data with greater accuracy than is possible manually, the user said.

SWRI's engine laboratory, which tests lubricating oils and other automotive products, uses a minicomputer data acquisition and test-monitoring system to collect and log temperatures, pressures and speeds.

The system prints out summary plots and tabulations in real time. It also alerts operators to the parameters that threaten to violate specification range limits, according to a spokesman.

Engines Operate At Once

The laboratory's data acquisition system (DAS) administers the tests for oil and chemical companies. Any of 50 engines can be operated simultaneously to perform the eight different programmed qualification tests to army specifications, he added.

Should an engine parameter approach specification range limits, an alarm message is printed on the teleprinter and displayed throughout the laboratory via a closed-circuit television system, alerting the operator where manual adjustments must be made.

Alarm test specifications are set closer than the actual test specifications so an alarm message will occur before the value actually goes out of limits, he noted.

The automated laboratory is operated by a Hewlett-Packard (HP) 2100A real-time minicomputer system with 24K memory and various signal conditioning and scanning electronics for taking readings, as well as I/O peripherals.

Another HP 2100A minicomputer system with a 32K memory capacity digital voltmeter and scanner controller spares provides backup data storage and I/O facilities to the engine laboratory system while also servicing general-purpose and software development needs.

Other products evaluated here include hydraulic oils, additives, automatic transmission fluids, fuels, antifreeze compounds, tires and engine componenta.

The institute is also engaged in a variety of applied research and development covering several scientific disciplines – biomedicine, electronics, mechanics, chemistry, physics and social sciences.

The DAS contains capacity for 800 separate analog channels, allowing 16 sequential channels to each engine.

The DAS includes the HP 7900A disk subsystem with capacity for 2.5M words. Also part of the system are an HP 2748A tape reader, three HP 2640A keyboard display terminals and an HP 2754B teleprinter, the user said.

The channels are assigned to take readings of cooling water-out temperature, water-in temperature, oil temperature, intake air temperature, exhaust temperature, intake and exhaust pressures, oil and jet pressure and humidity.

Disk Formatter Supports 3330s

SUNNYVALE, Calif. – Ball Computer Products has a microprocessor-based disk formatter subsystem with a minicomputer interface for disk drives using IBM 3330-type technology, the firm said.

Features of the Model 3300 disk formatter include the supporting of record formats in variable sizes, internal data encoding and decoding, error correction and a first-in, first-out (Fifo) buffering technique that matches disk speeds to minicomputer timing, the company said.

The 3300 accommodates up to eight spindles in a daisy-chain arrangement, Ball said. The formatter's microprocessor permits seek overlap operation, it noted.

The format technique allows standard minicomputer fixed-sector recording of any size; IBM-compatible variable-length record format can also be implemented, Ball said. The error-correction code is compatible with IBM code, the firm added.

The 3300 costs $5,000. Ball is located at 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Pharmacy Turnkey Based on Reality CPU

JENKINTOWN, Pa. – Health Care Computer Systems, Ltd. has a turnkey minicomputer pharmacy system designed for retail pharmaceutical consultants, hospitals and nursing home druggists, according to the firm.

The system keeps track of drug interaction and patient histories and offers a financial and billing subsystem.

Based on a 16K Microdata Reality minicomputer, the system includes 5M bytes of disk, a CRT, tape drive and 165 char./sec printer.

Users communicate with the system through local or remote terminals, the firm said.

The basic system costs $40,000 and software is licensed for $15,000. The company is located at Foxcroft Sq. Apartments, Jenkintown, Pa. 19046.

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CI Notes

NCR Extends Adds Contract For Another Three Years

HAUPPAUGE, N.Y. – NCR has extended for another three years its OEM contract for teletypewriter-compatible CRTs from Applied Digital Data Systems, Inc. (Adds).

The value of shipments to NCR between 1977 and 1980 should exceed $40 million, Adds predicted.

The Adds System 70 intelligent terminal is not included in the OEM agreement, but negotiations are being conducted concerning this product, Adds said.

The terminal maker estimated it will have shipped about $18 million in terminals to NCR by year-end 1976.

Wescon Nears Sellout

LOS ANGELES – Wescon/76 is nearing oversubscription despite advance planning to be about one-third larger than last year's sellout show.

There will be 725 exhibit units on the floor when the show opens its 25th "silver celebration" at the Los Angeles Convention Center here Sept. 14.

Bunker Ramo Realigns

WESTLAKE VILLAGE, Conn. – Bunker Ramo's Electronic Systems Division has integrated its marketing function with Program Management and Advanced Programs.

The realignment will provide more effective orientation to customer requirements and markets as well as a more practical environment for marketing equipment, according to Francis J. Cunningham, president.

Oil Industry's Use of DP Growing

PALO ALTO, Calif. – Computer services expenditures by oil companies will amount to $96 million in 1976 and will more than double by 1981, according to a recent analysis by Input.

Total DP expenditures in the oil industry will amount to about $1.8 million in 1976.

ADR Acquires Upjohn Scheme

The Upjohn Co. has agreed to sell to Applied Data Research, Inc. (ADR) the rights to a scheme it developed that allows in-company interactive execution of user programs previously processed on outside time-sharing services. Upjohn said the technology being sold increases the versatility of ADR's Roscoe.

By Bundling Leased Systems

IBM Stinting Maintenance Mart: Vaughan

By Edith Holmes
Of the CW Staff

NEW YORK – If users who lease equipment from IBM could select their maintenance vendor as those who have purchased systems from the corporation have been able to do since 1969, a whole new market area in the computer industry would open up, according to the former president of an independent maintenance company.

Appearing as a recent witness on behalf of the U.S. government in the trial of its antitrust case against IBM, Comma Corp.'s ex-president, James Ray Vaughan, said he would consider IBM's further unbundling, or separate pricing, of maintenance services advantageous to the marketplace.

He added he could not see how unbundled maintenance would have an adverse effect on IBM's leased computer systems and suggested there must be other ways for the corporation to protect its financial investment in leased systems.

If IBM were to unbundle its maintenance services and charge its leasing customers for these services, the corporation would probably have to monitor third-party maintenance companies for their parts quality, to inspect equipment maintained by third parties on a regular basis and to have performance bonds to which third parties would have to adhere, he speculated.

Vaughan, now general manager of engineering services marketing for Control Data Corp. and once an IBM employee, stated he believes IBM continues to bundle maintenance services where leased systems are concerned in order to protect its assets.

In addition, IBM gains valuable feedback on accounts from those charged with maintaining its systems, he said.

'Option of Selectivity'

An independent maintenance organization like Comma, which was acquired by CDC in 1973 and merged with that company last August, can provide users with "an option of selectivity" by permitting some choice in who maintains their systems, Vaughan said.

The selectivity option works in Comma's favor, too, because the company can decide what equipment it wants to service, he noted.

One of the few independent maintenance vendors, Comma does direct its efforts toward the maintenance of IBM computer systems, particularly the 360 models 30 through 65. But the company also handles equipment made by some peripheral companies and marketed by some leasing firms, Vaughan said.

For leasing companies, Comma offers a financial incentive in the form of the ownership credit in exchange for the chance to maintain their machines. For peripheral firms, Comma serves as a single maintenance source with its "call us first" policy, Vaughan said.

If a peripheral company is willing to pay a "triggering fee," Comma will begin business in a new area where the peripheral maker needs service for his equipment and want to develop markets, he added.

(Continued on Page 34)

FTC Charges TRW, AM Violated Clayton Act With Dual Director

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The Federal Trade Commission (FTC) has charged TRW, Inc. and the Addressograph Multigraph Corp. (AM) with violating the Clayton Act, which prohibits interlocking directorships between competing corporations.

Both firms have denied the allegation and deplored the investigation of a "moot" point.

The FTC alleged the antitrust law was violated when TRW's chairman, Horace A. Shepard, also served on AM's board between Jan. 1, 1973, and Nov. 6, 1975.

During that period the "business of TRW and Addressograph included, but was not limited to, the manufacture, sale and distribution in commerce of point-of-sale, credit authorization equipment and teller-opeated bank transaction equipment," the FTC complaint stated.

"By nature of their business . . . and location of operations with respect thereto, Addressograph and TRW were competitors, concurrent with respondent Horace A. Shepard's membership on the boards of directors of TRW and Addressograph," the FTC stated.

In its suit, the FTC is seeking to bar TRW and AM from having any common directors with each other or any of their competitors and to bar Shepard from serving simultaneously as a director for any competing firms.

"TRW vigorously denies there has been any illegal interlocking directorships between it and AM. Further, the allegation that TRW and AM manufactured and sold competing products while Mr. Shepard served as a director of AM is false," according to a TRW spokesman.

"TRW intends to take all possible action to contest the complaint," he added.

AM 'Thoroughly Dismayed'

A spokesman for AM said that company is "thoroughly dismayed" not only by the issuance of the complaint, but by the "superficial manner in which the investigation was conducted, by the commission staff's disregard for conscientious efforts

(Continued on Page 34)

Sycor Sues IBM for Infringement

CHICAGO – Sycor, Inc. has filed suit against IBM charging infringement of a patent covering source data entry terminals and methods of implementing such equipment.

In the action, filed in the U.S. District Court here, Sycor is seeking judgment against continuation of IBM's alleged infringement and an award of damages.

The complaint does not, however, state a specific amount for damages or refer to the specific patent number, an IBM spokesman said.

IBM is "confident we have not infringed on Sycor's patent," he added.

The patent in question is No. 3760375 according to Sycor. It is directed to data entry equipment, intelligent terminals in particular, which employ microprocessors to control the operation of a plurality of peripherals.

Sycor is not actually seeking damages but rather a royalty, according to Herbert S. Amster, Sycor vice-president of finance.

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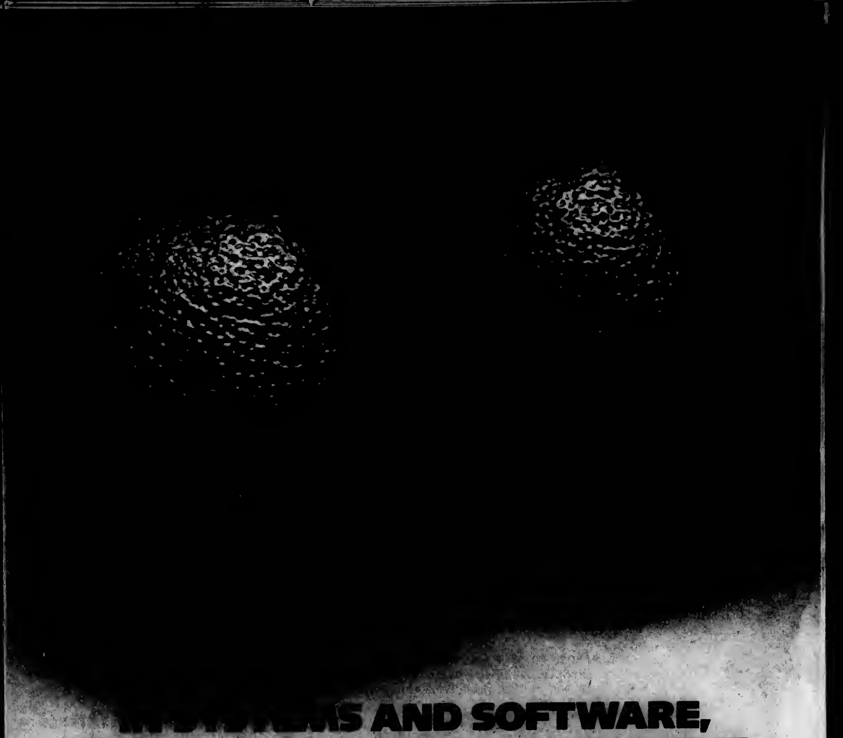

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IBM Bundling Seen Restricting Maintenance Market

(Continued from Page 32)

Comma generally prices its maintenance services on purchased IBM systems at 20% below IBM prices. In 1970-71, Comma achieved approximately 80% of the maintenance revenue gained by IBM for servicing 360 products, Vaughan said.

Comma has to obtain parts from IBM as well as from the vendors of the periphersls it services. While IBM does not offer a discount on parts, it has permitted Comma to acquire parts, IBM service manuals and engineer assistance with little difficulty, Vaughan said.

IBM "has done an excellent job in answering parts requests" and often "treated comma better than it did its own people," he added.

Many of Comms's customer engineers have come and continue to hail from IBM, lured to the independnet maintenance company for better pay, he said.

Differences With 370s

The former Comms president said the company had tried to follow the same pricing policy with respect to the 370 systems as it has with 360 machines only to find the 370 marketing environment substantially different from that of the 360.

Unlike IBM policies for 360s, features or particular hardware options could only be added to 370s by IBM personnel at the time of installation. Comma could no longer demonstrate its maintenance ability to customers by installing extra IBM features, Vaughan said.

To a certain extent, Comma had been closed out of maintaining 370s because IBM had come to consider these features and their installation company confidential information, Vaughan suggested. IBM had chosen to include in the 370s themselves the basic hardware needed to make engineering changes and considered proprietary the knowledge needed to activate those changes.

In addition, IBM provided users of 370 equipment with remote disgnostic capabilities in the hopes of "retaining" 370 systems. This diagnostic system contained the latest IBM engineering changes, but Comma didn't gain ready access to these changes and to the "symptom fix file" – a file of known historical problems on the machines and the best fixes available to them – until March of this year.

Finally, Vaughan stated, the Fixed Term Plan affected Comma's ability to sell its services to 370 users since purchased 370s carried with them one free year of maintenance, thus giving Comma one year less of product life in which to serve the customer.

Not Cause of Comma's Problems

At the time of CDC's acquisition of Comma in 1973, the maintenance the company was offering suffered from severe problems, but questioning by lawyers for IBM indicated the industry leader was not directly the cause.

Vaughan testified Comma had tried to train its own people on 370s rather than obtain engineers from IBM, but a management reorganization stalled marketing efforts to develop 370 maintenance business and so delayed the adequate use of these people.

Comma also had trouble automsting its accounts and accounting system. For a time it could not rely on its accounting data; it had problems with its invoicing system that resulted in outstanding costs tht had to be borne in 1974.

The company could not estimate its revenue from month to month within a 10% tolerance, and inaccurate invoices make it difficult to collect on bills, Vaughan said.

Since its merger with CDC a year ago, Comma has continued its efforts to enter the 370 maintenance market, Vaughan said.

TRW, AM Charged On Clayton Act

(Continued from Page 32)

by AM and others to place pertinent information before it and by the commission's decision to devote its time and federal funds now on a matter that has been entirely moot for several months."

Shepard, he noted, has not served on the board of AM since 1975.

AM firmly believes there was no competition between the two firms during Shepard's directorship, he added.

"However, even if Amcat credit authorization terminals were in competition with certain TRW products as alleged by the FTC, it would have been so inconsequential as to be meaningless under the law . . . since revenues produced by the sale of Amcat terminals in that fiscal year amounted to only 26/100 of 1% of AM's total revenues," the spokesman said.

AM further contended the FTC's regional office in Cleveland ignored an offer by AM to provide pertinent and detailed explanatory information and proceeded to request that the complaint be issued.

Hearings will be held Aug. 24.

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Says Industry Not Too Fragmented

Cadapso Sees No Need for Government Intervention

By Toni Wiseman
Of the CW Staff

TORONTO – The Canadian services industry is well equipped to meet that country's future needs and there is no justification for government intervention, the Canadian Association of Data Processing Service Organizations (Cadapso) said in a brief submitted to the Department of Industry, Trade and Commerce (ITC).

The privately owned computer services companies "have demonstrated an ability to grow with the needs of users and have significantly exceeded average rates of industrial growth," Cadapso stated.

The brief made five major recommendations aimed, according to Cadapso, at improving government understanding of the services industry's concerns.

The brief asked ITC to recognize the "unique" position of the industry, to support taxation policies "which will contribute to the viability" of the industry and to lend its support to Cadapso's position on such legislative matters as the revision of the Bank Act.

The Canadian computer services industry is not excessively fragmented and it is natural that the companies are concentrated in central Canada, where there is the greatest demand for DP servcies, Cadapso told ITC. And, the brief noted, telecommunications makes physical location questions irrelevant.

About 25 companies account for 75% of the total industry revenues, thereby achieving a relatively more substantial dominance within their industry than their U.S. counterparts, Cadapso said.

"There is a basic contradiction in the expressed desire to see a reversal of so-called fragmentation and, at the same time, an increase in the number of companies operating central computing facilities in the regions outside central Canada," the brief added.

"The natural play of the free market will bring about the desired rationalization of the industry while at the same time meeting those service market opportunities existing in eastern and western Canada.

International News

"Any attempt to interfere with natural economic conditions will inevitably produce distortions and therefore should not be undertaken," Cadapso warned.

The top 25 Canadian service companies have grown at a rate of 35% compounded annually from 1970 to 1974 and have shown the ability to "grow with the needs of the users."

The brief also noted deterrents to the growth of the services industry in Canada, such as the 30% capital cost allowance. The allowance is "a step in the right direction," but makes it difficult for Canadian companies to compete with U.S. firms because the U.S. cost allowance rate is 40%.

Unfair competition from banks, Bell Canada and "casual" service participants such as universities and private industries pose a threat to the industry's viability, the brief noted.

Software in Canada Gets Full Depreciation

OTTAWA – The Canadian government has issued a new federal budget which provides for a 100% capital cost allowance on software.

It also provides an increase from 20% to 30% in the depreciation allowance for computer hardware.

It was previously believed all software development could be expensed for tax purposes and software was therefore not regarded as a capital item.

In January, however, the Department of National Revenue issued an interpretation of the existing law which suggested software was a capital item and had to be depreciated on a company's books at a rate of 20% declining balance.

This would have had a depressing effect on software sales because it would have resulted in increased tax payout at the time of acquisition or development of major software, according to the Canadian Association of Data Processing Service Organizations (Cadapso).

As a result of Cadapso's efforts, the government came out with the revision which stated that, while software was indeed a capital item, it could be depreciated fully in the year of development.

1976–78 Pakistani Market Seen Limited for U.S. Gear

WASHINGTON, D.C. – Pakistan offers a limited market for office machinery and equipment, with total imports between 1976 and 1978 estimated at $10 million, according to a report from the U.S. Department of State.

The U.S. market share has remained relatively low and is not expected to rise above 10% in the next three years, mainly because of relatively higher prices and the import of machinery and equipment through European and British subsidiaries of the U.S. companies, State said.

Typewriters comprise the largest single component of total imports of office machinery and equipment. In 1974, typewriter exports to Pakistan were valued at $1.3 million, while computer exports for the same year were only $463,324.

Recent technological developments in areas of capital intensive production of microcircuitry have regained a competitive price and quality advantage for U.S. minicomputers, the report stated.

The State Department further noted that while the projected market for microcircuitry products in Pakistan is not large, Pakistanis tend to develop very strong brand loyalty and therefore the long-term market justifies an effort on the part of U.S. manufacturers.

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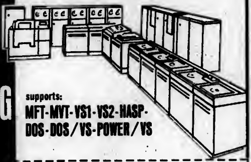

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CA Says Syfa Does Not Herald Abandonment of OEM Business

By Esther Surden
Of the CW Staff

IRVINE, Calif. – Although Computer Automation, Inc. (CA) is entering the commercial distributed processing arena with the introduction of the Syfa system, the firm will continue to make and market its OBM "naked" products, according to Philip Kaufman, director of corporate product planning.

"We are not abandoning" the OEM line nor "are we turning the direction of the company," Kaufman said in a recent interview here.

The Syfa system is the first product to come out of the firm's Commercial Systems Division. The division also makes the Syfa Information Station CRT, which will only be sold with the Syfa systems.

Natural Progression

The commercial system is a natural progression for the firm, according to D.H. Methvin, CA's president. "We built our corporate base on doing one thing and doing it very well in supplying computer equipment in volume to sophisticated customers," he said.

"We consider our Commercial Systems Division a logical adjunct to what we have been doing, and we are now ready to attack its market after eight years of building our strengths in products, management, service, finances and marketing in other marketing areas.

"We feel that these two divisions [Commercial Systems and OEM] will enable us to grow at a greater rate in the industry than if we had limited ourselves to just one segment," Methvin said.

The trend toward distributed processing in the industry is clear, Kaufman continued. His definition of distributed processing includes multiple computers communicating with each other with a disbursed data base.

"You cannot take all of your problems and put them in a large sack," he said.

A problem with distributed processing is convincing the person who has run a traditional DP shop and his users, who are comfortable passing a stack of cards through a window, that distributed processing is the way to go, he noted.

The Syfa system will be marketed and sold through a totally different sales force, Kaufman added, to selected potential customers.

Takes Systems Approach

As for the other segment of CA's business, the firm will continue to "take the systems approach," Kaufman said.

"In the OEM business, the key to getting the market is to be able to interface" to any company's I/O devices, Kaufman said.

CA has attacked the I/O problem in the last year, producing interfaces that are small processors and easily implemented, he added.

The trend toward microcomputers wss noted by Kaufman, who said "we don't really compete with microprocessors." The boundary between minis and micros is "mushy," he said, but "not as mushy as some people think. When you add a chassis, power supply and make the system easy to interface, then the line becomes more blurred.

"A lot of people who have used micros and got burnt" are headed back to minicomputers because they offer systems, Kaufman said.

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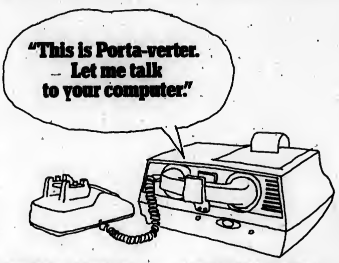
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Hi-Line Settles Suit Against Singer, IMA

DALLAS – The Singer System Ten is out and an NCR Century 101 is being installed at Hi-Line Electric Co. following settlement of Hi-Line's suit against Singer [CW, April 2, 1975] and an interim period with an NCR 8200.

Although Hi-Line's President J.P. Schaeffer indicated he wasn't happy with the settlement, he said the agreement was made under duress from his wife.

He had previously suffered a nervous breakdown and was scheduled to go out of the country over the Christmas holidays, so settled before he left, he explained.

"However, if I had it to do all over again, I would have taken them right on" through trial, and "if I'd had a fair trial I would have won, without a doubt," he said.

The firm installed an NCR 8200, but its growth rate was faster than anticipated becuase it started a new division. NCR then suggested a 101, he said.

Further, NCR is giving Hi-Line full credit on the 8200.

"NCR has been most fair and most decent with us. I have no complaints with it whatsoever. It has tried real hard," he said.

Hi-Line had filed suit against Singer Information Management Associates, Inc. (IMA), charging them with fraudulently representing the capacity and capability of the System Ten, for which IMA was to supply the programming.

The firm never received the CRT or accompanying software for this aspect of the system and returned the system in August 1973, a year after it had signed the lease agreement.

Orders & Installations

Exxon Co, has ordered for lease a Trace data capture system and two high-speed sorters from Recognition Equipment, Inc. for installation in its credit-card processing center.

American Management Systems has ordered an IBM 370/155 to double the capacity of its computer center.

Mellon Bank of Pittsburgh has ordered an Incoterm Series 7000 on-line banking system for installation at its headquarters and in over 100 branches in western Pennsylvania. The equipment is valued at over $5 million.

The U.S. Air Force Avionics Laboratory has installed four high-speed digital computers from Westinghouse Electric Corp. for an avionics "hot bench" facility which is part of the U.S. Air Force Digital Avionics Information System program.

Strong's News Agency, a magazine distributor in Arizona, has ordered a 90/30 system from Univac for distribution, general accounting, billing, payroll and other business applications.

Hinky Dinky Stores of Omaha, Neb., has ordered Datachecker electronic point-of-sale systems for three stores from National Semiconductor Corp.

Retailers Electronic Account Processing, Inc. has ordered 100 Source 7600 programmable accounting terminals from MSI Data Corp. for use by independent retail soft goods stores for computerized accounting and billing of their own charge-card customers..

The Asbury Park Press of Asbury Park, N.J., has ordered a T-410 publishing system from Tal-Star Computer System, Inc. for on-line processing of classified advertising, wire service and news copy.

Continental Oil Co. has ordered a Control Data Corp. Cyber 172 system, valued at nearly $3 million, to aid in its search for producible reserves of oil of natural gas.

European-American Banking Corp. of New York, has ordered a Trace check-processing system for lease from Recognition Equipment, Inc.

Cherry Creek School District Number 5 in Englewood, Colo., has installed a Burroughs B1726 system for administrative functions and hands-on training of students.

Rockingham National Bank of Harrisonburg, Va., has purchased a U-COM computer output microfilm system from U.S. Datacorp.

The *Peoria Journal Star* has ordered a Series 2500 copy-processing system from Harris Corp.'s Composition Systems Division. The system will include 16 Harris 1500 editorial terminals, four 2200 display advertising layout terminals and two 7400 Fototronic phototypesetters..

The U.S. Army has installed an IBM 360/50 at Presidio, Calif., under a contract with Dearborn Computer Leasing Co.

The Nevada Industrial Commission has installed Adabas from Software AG on the State of Nevada Central Computer Facility to develop the Workmen's Compensation Policy and Claims System.

POSITION ANNOUNCEMENTS

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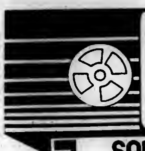

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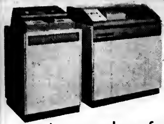

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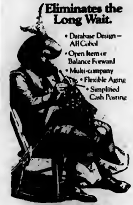

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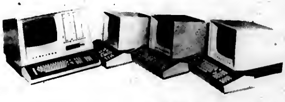

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Western Electric Improved

AT&T Expects 'Very Good' 1976

NEW YORK – AT&T will have a "very good" 1976, according to its chairman, John D. deButts, who cited improvements in Western Electric's earnings, AT&T's operating ratio and strong expense control as well as a reduction in the national rate of inflation.

The earnings of Western Electric,.AT&T's manufacturing arm, "are improving and should be considersbly better this year than they were last year," deButts said in a recent interview with the *Wall Street Journal*.

Bell's economists are forecasting nstional economic growth at 6.6% this year compared with a decline of 2% last year. The figures include the change in gross national product after adjustment for inflation.

The economists see the 1976 inflation rate cooling off to 5.8% compared with 9% last year, deButts said.

AT&T's operating ratio improved to 63.7% for the first five months this year compared with 65.3% a year ago, he added. The operating ratio is the portion of operating revenue needed to cover operating costs.

The firm's "expense control is better than it has ever been," deButts said. "We've really got a handle on this."

As an example of the "strong" budgeting system instituted, he noted the units last year began making five-year budgets.

Also, AT&T is initiating a "functional accounting" system that is expected to break out costs on such items as repair at customer premises.

AT&T intends to be competitive in private line communications and customer premises equipment, deButts said, through changes in rates and business practices if necessary.

CSC Doubles Quarter Net

EL SEGUNDO, Calif. – Computer Sciences Corp. (CSC) reported earnings more than doubled in the first quarter ended July 2..

Earnings jumped to almost $3.29 million or 23 cents a share compared with $1.52 million or 11 cents a share in the 1975 quarter.

First-quarter results included a special credit of $750,000 arising from the carryforward of a 1972 net operating loss.

This extraordinary credit is expected to continue in the remaining three quarters of the current year, the firm said.

Revenues in the quarter rose to $55.5 million from $50.4 million in the year-ago period.

The results "represent a continuation of CSC's strong earnings growth over the last three years," according to William R. Hoover, chairman and president.

Revenue growth accompanied by higher profit margins from operations and by a reduction of $250,000 in federal income taxes resulting from the commencement of a four-year amortizstion period for a $3.9 million investment tax credit carryforward contributed to the increase in quarter earnings, he added.

EMM Quarter Earnings Up Tenfold As Firm Erases Loss in Half-Year

LOS ANGELES – Electronic Memories & Magnetics Corp. (EMM) reported earnings for the second quarter were ten times those of the year-ago period despite a slight drop in revenues.

Figures for the six months reflected the same trend with earnings taking the place of a loss although revenues fell.

Earnings for the quarter were $1.3 million or 20 cents a share compared with $134,000 in the year-ago period.

The 1976 esrnings included a $710,000 tax eredit from loss on the sale of a subsidiary.

Revenues totaled $22.3 million compared with $25.2 million in the 1975 quarter.

The half-year earnings rose to $5.4 million or 92 cents a share, including an after-tax gain of $3.7 million on the sale of about one-half of EMM's holding of Sycor, Inc. common stock and the $710,000 tax credit.

This compared with a loss of $260,000 for the same six-month period in 1975.

Revenues for the six months were $43.2 million compared with $48.8 million in 1975.

EMM reported new order input continued strong for core and semiconductor memory products, with sales during the second quarter up 8% over the first quarter and order backlog increased by over 10% from the beginning of the year.

Applied Magnetics Net Rises 75% in Quarter

GOLETA, Calif. – Applied Magnetics Corp. reported earnings for the three months ended June 30 of $421,000 or 10 cents s share, a 75% gain over the $240,000 or 6 cents a share in the same 1975 period.

Revenues for the quarter totaled $16.05 million compared with $14.99 million in the year-ago quarter.

Nine-months earnings rose to $842,000 or 20 cents a share, a 68% increase over the $502,000 or 12 cents a share in the same period of 1975.

Revenues for the nine months slipped to $45.62 million compared with $46.94 million in the prior year.

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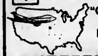

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Request for Proposal No. 261 for the lease or pur chase of a mark sense reader system for processing answer sheets to be used in the Missippi State Department of Education Statewide Standardized Testing Program.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

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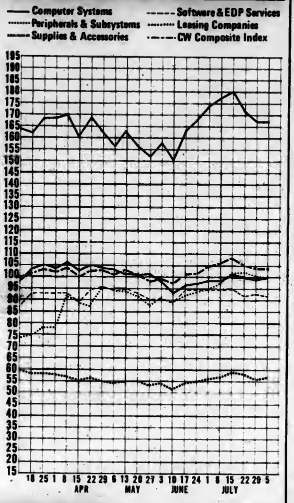

Earnings Reports

COMPUDYNE
Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	$.02
Revenue	10,899,172	10,031,989
Earnings	187,964	138,828
6 Mo Shr	.08	.05
Revenue	20,218,277	20,166,951
Earnings	365,777	271,611

COMPUTER NETWORK
Year Ended March 31

	1976	1975
Shr Ernd	$1.02	.....
Revenue	8,890,677	$3,821,947
Tax Cred	841,780	8,000
Earnings	1,330,518	(369,583)

COMPUTER USAGE
Three Months Ended March 31

	1976	1975
Shr Ernd	.....	$.19
Revenue	$2,048,887	1,235,184
Tax Cred	.....	55,500
Earnings	(96,456)	153,235
6 Mo Shr	.....	.42
Revenue	4,005,534	2,387,969
Tax Cred	.....	137,500
Earnings	(273,588)	327,088

COMTEN
Three Months Ended March 31

	1976	1975
Shr Ernd	$.05	$.02
Revenue	5,390,000	3,532,000
Tax Cred	40,000	25,000
Earnings	127,000	54,000

DECISION DATA COMPUTER
Year Ended Nov. 29

	1975	1974
Shr Ernd	.....	$.40
Revenue	$39,678,000	40,807,000
Tax Cred	.....	722,000
Earnings	(8,417,000)	1,511,000

DIGITAL COMPUTER CONTROLS
Three Months Ended May 31

	1976	1975
Shr Ernd	$.32	$.06
Revenue	4,846,149	2,339,393
Earnings	495,725	89,462

ELECTRONIC ASSISTANCE
Three Months Ended April 30

	1976	1975
Shr Ernd	$.18	.....
Revenue	9,484,000	$7,626,000
Disc Op	.....	(23,000)
Tax Cred	82,000	.....
Earnings	314,000	(233,000)

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 4, 1976

All statistics compiled, computed and formatted by
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COMPUTER SYSTEMS

EXCN		PRICE 1976 RANGE (1)	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	95 1/4	- 1/2	-0.5
O	COMPUTER AUTOMATION	10- 19	16 7/8	+ 5/8	+3.8
N	CONTROL DATA CORP	18- 27	24 1/8	+1	+4.3
N	DATA GENERAL CORP	40- 60	51	- 1/4	-0.4
O	DATAPOINT CORP	24- 46	39 1/4	+1 1/4	+3.2
O	DIGITAL COMP CONTROL	2- 7	5 5/8	- 3/8	-6.2
N	DIGITAL EQUIPMENT	138-181	170 1/8	+ 1/8	0.0
N	ELECTRONIC ASSOC.	2- 5	3	+ 1/8	+4.3
A	ELECTRONIC ENGINEER.	7- 16	10	+ 1/4	+2.5
N	FOXBORO	28- 47	46 7/8	+3 1/8	+7.1
O	GENERAL AUTOMATION	5- 11	7 1/2	+1 1/8	+17.6
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	106 3/4	-2 1/4	-2.0
N	HONEYWELL INC	34- 56	48	+ 5/8	+1.3
N	IBM	227-280	276 3/4	+3 3/4	+1.3
O	MANAGEMENT ASSIST	1- 3	2 1/4	+ 1/8	+5.7
O	MEMOREX	18- 33	26 7/8	+ 3/8	+1.4
O	MICRODATA CORP	10- 27	26	+2	+8.3
O	MODULAR COMPUTER SYS	5- 14	5 1/2	-5 3/4	-51.1
N	NCR	24- 34	34 1/8	+1	+3.0
O	PRIME COMPUTER INC	4- 14	13 1/4	- 3/4	-5.3
N	PERKIN-ELMER	19- 27	20 3/4	-1 3/8	-6.2
N	RAYTHEON CO	45- 66	63	+2 1/2	+4.1
N	SPERRY RAND	40- 52	46 7/8	+ 1/8	+0.2
O	SYCOR INC	20- 31	21 1/2	-1 1/2	-6.5
A	SYSTEMS ENG. LABS	6- 10	8 3/8	- 1/8	-1.4
N	VARIAN ASSOCIATES	13- 17	14 1/2	0	0.0
A	WANG LABS.	11- 20	15 1/2	0	0.0

LEASING COMPANIES

EXCN		PRICE 1976 RANGE (1)	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	+ 1/4	+5.4
A	COMMERCE GROUP CORP	2- 5	2 3/4	- 1/8	-4.5
A	COMPUTER INVSTRS GRP	1- 3	2	+ 1/4	+14.2
N	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	7 1/4	+ 1/8	+1.7
A	GREYHOUND COMPUTER	3- 8	7 1/8	- 1/8	-1.7
N	ITEL	6- 15	13 3/8	- 1/4	-1.8
N	LEASCO CORP	6- 19	17 1/4	+1 3/4	+11.2
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	MRG INC	0- 1	3/8	- 1/8	-25.0
A	PIONEER TEX CORP	6- 9	7 1/4	- 1/8	-1.6
N	U.S. LEASING	7- 12	10 1/2	+ 1/4	+2.4

SOFTWARE & EDP SERVICES

EXCN		PRICE 1976 RANGE (1)	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC	8- 11	8 1/2	+ 1/8	+1.4
A	APPLIED DATA RES.	2- 4	3 5/8	- 1/8	-3.3
N	AUTOMATIC DATA PROC	17- 35	34	+1	+3.0
O	COLEMAN AMERICAN COS	3- 6	3	0	0.0
O	COMPUTER DIMENSIONS	3- 7	5 1/2	+ 1/4	+4.7
O	COMP ELECTION SYSTMS	5- 9	6	- 1/2	-7.6
O	COMPUTER HORIZONS	1- 2	2	0	0.0
O	COMPUTER NETWORK	2- 6	3 1/2	+ 1/4	+7.6
N	COMPUTER SCIENCES	4- 8	6 5/8	0	0.0
O	COMPUTER TASK GROUP	1- 1	1 1/4	- 3/8	-23.0
O	COMPUTER USAGE	3- 6	2 3/4	- 1/8	-4.3
O	COMSHARE	2- 9	6 3/4	- 3/4	-10.0
O	DATA DIMENSIONS INC	2- 4	5	0	0.0
O	DATATAB	1- 1	1	+ 1/8	+14.2
N	ELECTRONIC DATA SYS.	12- 16	14 3/4	+1 5/8	+12.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 5/4	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	- 1/4	-18.1
O	KEANE ASSOCIATES	2- 4	5 3/8	0	0.0
O	KEYDATA CORP.	2- 5	2 3/8	- 1/8	-5.0
O	LOGICON	4- 4	3 5/8	+ 1/8	+3.5
A	MANAGEMENT DATA	1- 3	2 1/4	0	0.0
A	NATIONAL CSS INC	13- 25	21 5/8	- 1/8	-0.5
A	ON LINE SYSTEMS INC	18- 22	19	+ 3/8	+2.0
N	PLANNING RESEARCH	3- 5	3 1/2	- 1/4	-6.6
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	+ 1/8	+6.2
O	REYNOLDS & REYNOLD	13- 21	18 1/4	+ 1/2	+2.8
O	SCIENTIFIC COMPUTERS	1- 1	1/2	0	0.0
O	TYMSHARE INC	19- 28	26	+ 5/8	+2.4
A	URS SYSTEMS	3- 5	3 3/4	- 1/4	-6.2
N	WYLY CORP	2- 7	2 5/8	- 1/8	-4.5

PERIPHERALS & SUBSYSTEMS

EXCN		PRICE 1976 RANGE (1)	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10	+ 1/4	+2.5
O	ADVANCED MEMORY SYS	4- 10	7 1/2	- 3/8	-4.7
N	AMPEX CORP	5- 10	E 5/8	0	0.0
O	ANDERSON JACOBSON	2- 4	2 5/R	- 1/8	-4.5
O	APPLIED DIG DATA SYS	13- 25	22	- 1/4	-1.1
O	BEEHIVE MEDICAL ELEC	3- 9	8	- 1/6	-1.5
A	BOLT, BERANEK & NEW	7- 11	9 3/8	- 1/8	-1.3
N	BUNKER-RAMO	3- 10	8 7/8	0	0.0
B	CALCOMP	4- 7	5 1/2	+ 1/8	+2.3
O	CAMBRIDGE MEMORIES	0- 6	7/8	+ 1/2	+133.3
N	CENTRONICS DATA COMP	20- 36	33 3/8	+2	+6.5
O	CODEX CORP	22- 42	32 1/2	+ 1/2	+1.3
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	5 5/8	+1 1/8	+25.0
O	COMPUTER CONSOLES	4- 7	5 1/2	- 1/4	-4.3
A	COMPUTER EQUIPMENT	1- 3	1 7/8	+ 1/4	+15.3
O	COMPUTER TRANSCEIVER	1- 3	7/8	- 1/8	-12.5
O	COMTEN	4- 9	8	6	0.0
N	CONRAC CORP	20- 25	22 7/8	- 7/8	-3.6
O	DATA ACCESS SYSTEMS	1- 4	5 1/4	0	0.0
O	DATA 100	7- 13	8 5/8	+ 1/2	+6.1
A	DATA PRODUCTS CORP	5- 15	14	+1	+7.6
O	DATA TECHNOLOGY	1- 2	1 3/8	- 1/8	-8.3
O	DATUM INC	1- 2	1 1/2	- 1/4	-14.2
O	DECISION DATA COMPUT	1- 4	1 3/4	- 1/4	-12.3
O	DELTA DATA SYSTEMS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/8	- 1/8	-1.3
N	HARRIS CORP	34- 54	53 1/2	+2 1/2	+4.9
A	INCOTERM CORP	9- 20	10 1/4	+ 1/8	+1.2
O	INFOREX INC	3- 7	3 3/4	- 1/8	-3.2
O	INFORMATION INTL INC	10- 18	11 1/2	+ 1/8	+1.0
O	INTEL CORP	60-109	64	+1	+1.5
A	LUNDY ELECTRONICS	4- 7	4 1/E	- 1/4	-3.7
O	MSI DATA CORP	3- 7	6 5/R	- 1/4	-3.6
A	MILGO ELECTRONICS	15- 21	19 3/8	+ 7/8	+4.7
N	MOHAWK DATA SCI	3- 9	8 7/8	+1	+12.6
O	PENRIL CORP	1- 5	1 7/8	0	0.0
A	PERTEC CORP	3- 8	5 1/2	- 1/4	-4.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 6	5	0	0.0
O	RECOGNITION EQUIP	6- 11	8 1/4	- 3/8	-4.3
N	SANDERS ASSOCIATES	6- 11	9 1/2	- 1/8	-1.2
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12 1/2	+ 5/8	+5.2
O	T BAR INC	5- 10	6	+ 1/4	+4.3
O	TALLY CORP.	4- 6	4 3/4	0	0.0
O	TEC INC	3- 5	3 3/4	0	0.0
N	TEKTRONIX INC	45- 67	65	-1 1/4	-1.8
N	TELEX	2- 3	3 1/4	- 3/8	-10.3
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 3/4	- 1/8	-4.3

SUPPLIES & ACCESSORIES

EXCN		PRICE 1976 RANGE (1)	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/4	- 1/4	-7.1
A	BARRY WRIGHT	6- 10	7 7/8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	3/6	0	0.0
A	DATA DOCUMENTS	30- 42	29 3/4	- 1/4	-0.8
O	DUPLEX PRODUCTS INC	14- 24	14 3/8	- 5/8	-4.1
N	ENNIS BUS. FORMS	6- 8	6 5/8	+ 1/4	+3.9
O	GRAHAM MAGNETICS	8- 13	10	+1	+11.1
O	GRAPHIC CONTROLS	13- 19	15 1/2	+1	+6.8
N	3M COMPANY	53- 65	60	+ 1/8	+0.2
O	MOORE CORP LTD	40- 51	42	+1 1/2	+3.7
N	NASHUA CORP	11- 17	17 3/6	+1 1/8	+6.9
O	STANDARD REGISTER	15- 19	15 3/4	+ 1/4	+1.6
O	TAB PRODUCTS CO	5- 11	9 1/2	- 1/2	-5.0
N	UARCO	21- 25	21 1/2	0	6.0
A	WABASH MAGNETICS	4- 8	7 3/8	- 1/8	-1.6
N	WALLACE BUS FORMS	19- 25	20	- 1/4	-1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

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Here's where we'll be going in 1977:

City	Dates
San Francisco	March 29-April 1
Los Angeles	April 5-7
Cleveland	April 19-21
Minneapolis/St. Paul	April 26-27
Chicago	May 3-5
New York	May 10-12
Philadelphia	May 24-26
Washington, D.C.	May 31-June 2
Boston	June 7-9

Exhibitor Participation Plans

There are several ways for you to participate in the 1977 Caravan, and you can choose the one most suited to your company's marketing needs. Most Caravan exhibitors get complete, national coverage with our full-tour, standard booth and complete package of support services. OEM exhibitors—or those who wish to cover major cities only—can exhibit in our Major City/OEM tours with a standard booth and complete support package. The five cities in the Major City/OEM tours are San Francisco, Los Angeles, Chicago, New York and Boston.

If you don't need a full booth to tell your story, then the minibooth is available at a mini price. The minibooth comes ready for participation in the Full Tour and the Major City/OEM Tour with a complete package of Caravan services. The minibooth offers you a unique advantage: it does not have to be manned in every city. So you get personal contact selling where you need it, and a travelling billboard where you don't. In the un-manned cities, the Caravan staff will stock your exhibit with your literature and sales aids, then collect inquiry cards from interested attendees and forward them on to you. Attendee-activated or continuous loop slide or film programs can be used to highlight your sales message in a graphic and memorable way. In those cities where you have field sales staff, they can man the exhibit and get the full benefit of face-to-face Caravan contact.

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